# PREFACE.

THE present Volume does not differ in any important particulars from the preceding Volumes. It contains only one special Appendix, giving the results of the Discussion of Four Years Anemometrical Observations at Bermuda.

The Mean Results for the more important elements from the Seven Observatories have been given both in the English and French scales, in accordance with the resolution adopted at the Meteorological Conference at Leipzig in August 1872.

November 1873

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# ERRATA.

| | | | | |
|---|---|---|---|---|
| Page 35, line 34, | Stonyhurst, January, | for | 11th, 11 a.m. | read 12th, 11 a.m. |
| „ 36 „ | 15, Kew, February, | „ | 29·862 and −0·146 | „ 29·831 and −0·177. |
| „ „ „ | 28, Aberdeen, March, | „ | +0·011 | „ −0·011. |
| „ „ „ | 29, Falmouth, March, | „ | 29·293 and 1·058 | „ 29·133 and 1·218. |
| „ 38 „ | 3, Valencia, March, | „ | 47°·0 and +1°·6 | „ 47°·5 and +2°·1. |
| „ „ Table of 5-day means, | Kew, January 11–15, | „ | +4°·0 | „ +5°·0. |
| „ „ | „ „ 21–25, | „ | +1°·7 | „ +6°·2. |
| „ „ | „ „ 26–30. | „ | +1°·1 | „ +5°·6. |
| „ „ | „ February 31–4, | „ | +3°·4 | „ +7°·7. |
| „ „ | „ March 17–21, | „ | −0°·1 | „ −1°·0. |
| „ „ | „ „ 22–26, | „ | −5°·8 | „ −6°·8. |
| „ 39, line 22, | Newcastle, March, | „ | 3·30 + 0·71 | „ 3·36 + 0·77 |
| „ 52 „ | 26, Armagh, April, | „ | 29·949 and + ·045 | „ 29·939 and + ·035. |
| „ 53 „ | 4, „ May, | „ | 29·132, 4th, 5 a.m. and 1·287 | „ 29·118, 4th, 6 a.m. and 1·301. |
| „ 54 „ | 6, Aberdeen, April. | „ | 25°·9 | „ 25°·1. |
| „ „ „ | 38, Falmouth, June, | „ | 6th, midnight | „ 7th, 5 a.m. |
| „ 56 „ | 23, Holyhead, Height of Gauge, | „ | 1ft. 2 in. and 44 ft. | „ 9 ft. 0 in. and 24 ft. |
| „ 63 „ | 19, Aberdeen, August, | „ | 18th, 4 p.m. | „ 18th, 11 p.m. |
| „ „ „ | 32, Glasgow, September, | „ | 14th, 10 a.m. | „ 14th, 8 a.m. |
| „ 64 „ | 21, Aberdeen, August, | „ | 5th, 5 a.m. | „ 6th, 5 a.m. |
| „ „ „ | 38, Kew, September, | „ | 36°·4 and 22nd, 6 a.m. | „ 33°·5? and 22nd? |

# QUARTERLY WEATHER REPORT,

# 1872.

THE year opened very stormily. The recovery of pressure which had taken place over the British Isles on the last day of the old year had extended to Norway, but had been succeeded in the night by a sudden and rapid decrease, commencing at the western stations and extending very quickly to all our coasts. In central France the mercury had risen, so that while at 8 a.m. on the 1st the barometer was lowest in the north and north-west of the British Isles, the region of maximum pressure lay over France (Fig. 1, Plate I.). The gradient for south-westerly winds from Paris to Holyhead was 9, while from Holyhead to Greencastle it was as much as 12. A very heavy southerly gale was blowing in the west and north, having shown itself first at Valencia on the previous morning. Its chief violence was felt on our western coasts early on the 1st, but at 8 a.m. it had extended to the south of Norway, and later in the day blew hard from S.W. along the English Channel. At the mouth of the Elbe a heavy northerly swell rolled in for two days, but no serious wind was reported. On our western coasts the wind then moderated and veered, while the barometer rose very slightly. The following table is drawn up similarly to those in the previous volumes of the Quarterly Weather Report, and exhibits the principal particulars of the wind as recorded by the anemometers at certain fixed stations.

| Observatories, 31st Dec. 1871 to 2nd Jan. 1872. | Velocity, 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 8 a.m. (31st). | S.W. by S. | 10 a.m. (31st). | S. by W. | 55 | 21 | 7 a.m. (2nd) | S.W. | 47 | 4 & 5 a.m. (1st). | S. | 64 | Very sudden lull at 6 a.m. 1st for a few hours. |
| | | | Noon (1st). | S.S.W. | 44 | 9 | | | | | | | |
| Armagh | 6 p.m. (31st). | S. by W. | 5 a.m. (1st). | S. | 44 | 5 | 11 a.m. (1st) | S.W. by S. | 17 | 6 & 8 a.m. (1st). | S. | 47 | — |
| Glasgow | 1 a.m. (1st). | S. by W. | 4 a.m. (1st). | S. by W. | 48 | 9 | 1 p.m. (1st) | S.W. by S. | 13 | 7 a.m. (1st). | S. by W. | 51 | Wind continued generally fresh on the 2nd. |
| Sandwick | 2 a.m. (1st). | S. by E. | — | — | — | — | 1 p.m. (1st) | S.W. | 11 | 4 a.m. (1st). | S. | 39 | Wind had been blowing freshly from S.S.W. all the evening of the 31st. |
| Falmouth | Midngt. (31st). | S. by W. | 11 a.m. (1st). | S. | 45 | 8 | 7 p.m. (1st) | W. by N. | 20 | 4 p.m. (1st). | S. | 49 | — |
| Holyhead | 1 p.m. (31st). | S.W. by S. | 5 p.m. (31st). | S$^{ly}$. | 55 | 22 | 4 p.m. (1st) | S.W$^{ly}$. | 27 | 5 a.m. (1st). | S. | 68 | Velocity again increased to 30 and 35 miles from S.S.W. for the greater part of the 2nd. |
| Stonyhurst | 5 a.m. (1st). | S. by W. | — | — | — | — | 7 p.m. (1st) | S. by W. | 14 | 4 p.m. (1st). | S. | 40 | — |
| Halifax | Noon (1st). | S. | 3 p.m. (1st). | S.S.W. | 42 | 4 | 9 p.m. (1st) | W.S.W. | 9 | 6 p.m. (1st). | S.W. by S. | 44 | — |
| Alnwick Castle | 8 a.m. (1st). | S. by W. | 2 p.m. (1st). | S. by W. | 42 | 2 | 5 p.m. (1st) | S. by W. | 9 | 2 & 3 p.m. (1st). | S. by W. | 42 | — |

At Aberdeen velocities of from 30 to 39 miles from S. and S.S.W. were registered near the middle of the day, while at Kew and Yarmouth 30 miles was very slightly exceeded from the southward in the afternoon and evening. Immediately after the occurrence of the minimum pressure a sudden fall of temperature took place at Valencia, accompanied by a slight veering, and decided lull, of the wind, and the cessation of rain. With some modifications we find the same phenomena repeated at Armagh at 11 a.m., Glasgow at 1 p.m., Falmouth at 6.30 p.m., and Stonyhurst at 7.30 p.m.; but at Kew, which seems to have been scarcely touched by the body of the gale, no such changes were noted, and at Aberdeen the whole thing is considerably modified. Rain fell generally, heavily on the Welsh coasts. Showers of hail occurred at Valencia, and at night squalls and frequent lightning at Roche's Point.

Jan. 2. At 8 a.m. the centre of the disturbance was apparently some distance to the north-north-westward of Scotland. The western pressures were recovering slowly, while those in the north were very unsteady; but very little change was noticed in the south-east. Though the wind had become moderate in England and the south of Ireland, a gale still blew in Norway, the west of Scotland, and at Greencastle. Temperature was very changeable at Valencia, but the sky cleared generally.

Jan. 3. The recovery of pressure in the west had continued slowly, except at Valencia (where since 3 a.m. the barometer had begun to fall again), and become general throughout our islands, but had not extended to Norway and Denmark. In Spain and over the Mediterranean the glass rose. The lowest reading (at Christiansund) was 0·9 inch lower than that at Corunna, giving a general gradient of 3 for westerly winds. In Norway and the Shetlands the gale continued. Elsewhere light to moderate south-westerly breezes were general, to which direction the wind had "backed" again in England and Ireland, with a rise of temperature on our south-west coasts and over France. A fresh disturbance was approaching us from the south-westward, and at 11 a.m. the barometric fall became more rapid at Valencia, the other observatories soon showing a similar change, while the wind gradually backed to S. and rose to a gale on our west and south-west coasts. At 6 p.m. a westerly gale was blowing at Scilly, a southerly gale in the Irish Sea, and an E.S.E. gale in the north of Ireland (*see* Fig. 2, Plate I.). The new disturbance spread with great rapidity, as the gale extended to all our coasts in the night, accompanied by rain and a high sea, especially in the west. A thunderstorm occurred at Sheffield, and lightning was seen in the south of Ireland. The storm was, however, of short duration, and at 8 a.m. on the 4th (the centre then being a little to the north-westward of Scotland, *see* Fig. 3, Plate I.), the wind had already moderated somewhat and veered to W. in the English and St. George's Channels, though it still blew hard at all the south-eastern and north-western stations and over the north of France. The chief features of the gale are shown in the following table.

| Observatories, Jan. 3–4, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 9 a.m. (3rd). | S. | Noon (3rd). | S.S.E. | 48 | 9 | 5 a.m. (4th) | W.S.W. | 20 | 5 p.m. (3rd). | S. | 59 | There was a lull from 9 to 11 p.m. 3rd, wind being then S.W. by W. |
| Armagh | 5 p.m. (3rd). | S. by E. | — | — | — | — | 11 p.m. (3rd) | S. | 6 | 7 & 9 p.m. (3rd). | S. | 38 | — |
| Glasgow | 10 p.m. (3rd). | S.E. by S. | — | — | — | — | 4 a.m. (4th) | S.S.W. | 6 | 2 a.m. (4th). | S.S.E. | 38 | — |
| | 10 a.m. (4th). | S.W. | — | — | — | — | 3 p.m. (4th) | S.W. | 5 | | | | |
| Aberdeen | 11 p.m. (3rd). | S. by E. | 4 a.m. (4th). | S. by E. | 43 | 2 | 7 a.m. (4th) | S.S.W. | 8 | 5 a.m. (4th). | S. by E. | 44 | — |
| Sandwick | 9 p.m. (3rd). | S. by E. | Midngt. (3rd). | S.S.E. | 48 | 8 | 9 a.m. (4th) | S. | 12 | 4 a.m. (4th). | S.S.E. | 52 | — |
| Falmouth | 5 p.m. (3rd). | S. by W. | 9 p.m. (3rd). | S. | 46 | 5 | 7 a.m. (4th) | W. by S. | 14 | 11 p.m. & Midnight (3rd). | S. by W. | 49 | — |
| Holyhead | 3 p.m. (3rd). | S. by E. | 6 p.m. (3rd). | S. by E. | 56 | 8 | 7 p.m. (4th) | S.S.W. | 28 | 11 p.m. & Midnight (3rd). | S.S.E. | 62 | A very decided lull to 25 miles occurred at 3 a.m. 4th, when wind shifted to south-westward, varying much. |
| | | | 6 a.m. (4th). | S.W. | 45 | 2 | | | | | | | |
| Stonyhurst | 11 p.m. (3rd). | S. | Midngt. (3rd). | S. | 45 | 4 | 4 a.m. (4th) | W. | 5 | 2 a.m. (4th). | S. | 48 | — |
| Halifax | Midngt. (3rd). | S. | 1 a.m. (4th). | S. by W. | 43 | 3 | 5 a.m. (4th) | W.S.W. | 5 | 1 & 3 a.m. (4th). | S. by W. | 47 | — |
| Alnwick Castle | 2 a.m. (4th). | S. by E. | — | — | — | — | 6 a.m. (4th) | S.W. by S. | 4 | 3 a.m. (4th). | S. by E. | 39 | At 1 p.m. wind rose to 41 miles from S.W. by W. for 1 hour only. |
| Kew | 1 a.m. (4th). | S. by W. | — | — | — | — | 8 a.m. (4th) | W.S.W. | 7 | 4 a.m. (4th). | S. | 37 | — |
| Yarmouth | 3 a.m. (4th). | S. | 6 a.m. (4th). | S. | 43 | 1 | 9 a.m. (4th) | S. by W. | 6 | 6 a.m. (4th). | S. | 43 | — |

A decided lull is shown nearly everywhere, while the wind was shifting from the southward towards S.W., followed by a renewal of the gale, or of strong winds, from the more westerly points.

At the extreme northern stations this disturbance followed very rapidly that which had preceded it; for while on the evening of the 3rd the westerly and south-westerly gales still held at Christiansund, by 8 a.m. on the 4th they had not only lulled, but, after a slight recovery of pressure in that vicinity, the barometer had again fallen more than half an inch in the Shetlands, and a very heavy S.E. gale had set in. (*See* Figs. 2 and 3, Plate I.)

Rain had again been general, though not very heavy, and aurora had been seen in London at night. During the morning of the 4th the slight rise of the barometer which had commenced on our south-west coasts in the night extended to the north and east parts of the country, but it did not last long, being succeeded before night by a renewed fall, which commenced at Valencia and Falmouth shortly before noon. A new depression was advancing on us rapidly, and in the ensuing night its centre passed from S.W. to N.E. over Ireland.

Jan. 5. At 8 a.m. barometrical readings were much reduced everywhere, the lowest (28·5) being found at Aberdeen. An extensive depression lay over Scotland, and the gradient from Lyons to Cape Gris Nez was nearly 12 for south-westerly winds, while thence to Aberdeen it was 6 for westerly winds (*see* Fig. 4, Plate I.). A severe S. and S.W. gale prevailed over central and northern France, Belgium, Holland, and Denmark, a S.S.E. gale at Oxö, and strong S.E. breezes in the west of Norway. On our S. and S.W. coasts a stiff S.W. gale had been felt in the night, but had abated in most places, though it still blew rather hard from W. at Pembroke (Fig. 4, Plate I.). In Scotland light airs prevailed. The following short table gives the usual details of the gale as registered by the anemometers on our own coasts, but the chief violence of the gale was felt on the continent, "a hurricane" being reported from Paris.

| Observatories, Jan. 4–5, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Falmouth - | 1 p.m. (4th). | S.W. by S. | 8 p.m. (4th). | S. | 48 | 5 | 5 a.m. (5th) | W. by S. | 16 | 10 p.m. (4th). | S.W. by S. | 54 | — |
| Holyhead - | 5 a.m. (5th). | S.W. by S. | 5 a.m. (5th). | S.W. by S. | 47 | 6 | 11 a.m. (5th) | W.S.W. | 6 | 8 a.m. (5th). | S.W.byW. | 53 | — |
| Kew - - | Midngt. (4th). | S. | 1 a.m. (5th). | S.S.W. | 42 | 4 | 7 a.m. (5th) | S.W. | 7 | 3 a.m. (5th). | S.S.W. | 44 | — |
| Yarmouth - | Midngt. (4th). | S. | 1 a.m. (5th). | S. by E. | 43 | 1 | 7 a.m. (5th) | S.W.byW. | 7 | 1 a.m. (5th). | S. by E. | 43 | — |

At Stonyhurst and Valencia a velocity of rather above 30 miles an hour from the south-westward was felt, but at the more northern observatories nothing but light winds were registered.

The very sudden dip noticed in the Falmouth barogram at midnight seems to point to some small additional depression in that neighbourhood, the effect of which would be to reduce the gradients over our islands, while those over France were rendered steeper, thus accounting for the great violence of the gale on the continent, as compared with that on our own coasts.

Temperature rose on the continent and in the south-east of England, but fell fast in Scotland, where it was below freezing point. Rain was general, heavy in the south-west, and the weather was *very* unsettled. Lightning had again occurred at Roche's Point and Pembroke, and the observer at Sumburgh Head reported a very heavy thunderstorm after 4 a.m. Snow fell at Alnwick. The sea ran very high in the Bay of Biscay, on our south-west coasts, and on the coasts of Norway and the Shetlands.

The mercury now began to rise again in nearly all parts of the British Isles, but fell rapidly in Norway, and at 2 p.m. the reading of 28·44 ins. was reported from Skudesnaes, with a S.E. gale at the time. In most places the wind veered westward, but in the evening a further disturbance passed over England (*see* the Falmouth, Stonyhurst,

and Kew barograms, Plate I.), and the wind again rose to a gale from S.W. in the English and Bristol Channels, accompanied in most places by hail, thunder, and lightning. Rain again fell generally but not heavily, and some snow was reported at Armagh.

Jan. 6. Pressure had increased everywhere but at Christiansund, where it was lowest, and it would seem that the depression which had crossed England on the evening of the 5th was now over the North Sea. Temperature was very unsteady, especially in the south-west. It had risen in Scotland but fallen in France and England, particularly in Paris and on our south-east coasts; elsewhere the changes were slight. The winds, though generally moderate on our coasts, were gusty from W. and S.W., and blew hard from the westward on the south-eastern shores of the North Sea. The weather continued showery, hail and lightning being reported from the southern stations. At 6 a.m. a sudden fall of temperature occurred at Falmouth, accompanied by a marked oscillation of the barometer, a shift of wind, and heavy rain, the same occurrence being registered at Kew six hours later.

Jan. 7. Though the barometer had risen considerably at the extreme northern stations, yet pressure in that neighbourhood was still much lower than over Spain and the south of France, and had been giving way again in Ireland since about 2 a.m. During the day a large but shallow depression crossed the western and northern parts of our islands, extending itself considerably to the south-eastward as it went over. The winds which accompanied it were not generally serious, though they exceeded 30 miles an hour at several of the western stations, and blew a strong breeze from S.W. in the Bay of Biscay, apparently in consequence of the larger disturbance being accompanied by a smaller and local one which travelled up the English Channel, and lay over Belgium on the following morning. The weather was still wet and unsettled; hail fell on our south-west coasts, and thunder occurred in Cornwall.

Jan. 8. During the day the mercury rose unsteadily in our islands. Temperature changed little; but the wind, after temporarily backing to the south-westward on our north-west coasts in the afternoon, veered again quickly. The larger depression disappeared, and a considerable change of the general conditions set in.

Jan. 9. The barometer had risen considerably on the western and northern coasts, while in the north of Germany it fell slightly. A clearly marked but not serious depression lay near the Helder, producing light to moderate north-westerly winds in England and Ireland, and strong north-westerly breezes over the Bay of Biscay and at the mouth of the English Channel. At the same time light S.W. winds prevailed in the north of Germany, and moderate north-easterly winds in Norway. Temperature nevertheless rose a little in our islands, except on the east coast, and rain fell. The sky was cloudy generally, and snow fell at Rugby in the night.

Jan. 10. A rapid rise of the barometer over Germany, Denmark, France, and Great Britain, was accompanied by a reduction of pressure in Ireland, commencing at the most western stations soon after midnight of the 9th. The region of maximum pressures, which slightly exceeded 30·1 ins., lay over western and northern France and the south-east of England. To the north-west of this region readings decreased to 29·8 ins. in the west of Ireland, while to the south-eastward they decreased to 29·3 ins. in Greece and the S. of Italy; gradients were therefore slight. The wind, however, backed to S. and freshened in the west of our islands to a velocity of rather above 30 miles in Ireland and of 46 miles at Holyhead, with a further rise of temperature, and rain; while in the north the thermometer fell several degrees and the sky cleared temporarily. In the ensuing night the fall of the barometer ceased at Valencia and the wind veered a little, rainy weather becoming general throughout the kingdom.

Jan. 11. The western recovery of pressure extended to the rest of the British Isles. The wind, which at 8 a.m. was generally south-westerly, with cloudy and wet weather, fell light, and veered to N.W. in Great Britain as the day advanced. Temperature, which had risen fast, again fell and became very low, but the weather cleared and was finer than of late. In Ireland, however, conditions were not so favourable, for at night the barometer again began to fall a little, and the wind returned to the southern quarter and freshened, with a renewal of rain, fog, and warmer weather.

Jan. 12. Barometrical readings were high except on our western and northern coasts. A very shallow depression had apparently formed over the North Sea round which the wind circulated, blowing freshly from S. and S.E. on its eastern shores, and lightly from N.W. on our east coast. In the west, however, the southerly current had become established, but was as yet comparatively light in most places, though at Valencia and Holyhead it rose to a slight gale for a short time. In the south of Europe the barometer continued to rise steadily. At 10 p.m. a rapid decrease of pressure set in at Valencia.

Jan. 13. The general conditions of pressure at 8 a.m. are shown in Fig. 5, Plate III.; from which it will be seen that readings were lowest at our western stations, and highest over the south-west and centre of France. The gradient from L'Orient to Valencia exceeded 9. Fresh to strong south-westerly breezes blew over the greater part of these islands, and an east-south-easterly gale at Skudesnaes. Temperature had again risen fast, the change exceeding 10° in many places; thick fog prevailed on the S.W. coasts of Great Britain, and heavy rain had set in at most places. During the day the decrease of pressure became more rapid, and at 2 p.m. the minimum reading (29·3 ins.) was reached at Valencia. The wind rose to a fresh gale from S. and S.W. on our western coasts, which, however, soon veered, and the depression travelled northwards. The decrease of temperature at Valencia, which accompanied the shift of wind from S. to W.N.W., was very sudden (*see* Plate III.), though not

more extensive than at most of the other observatories. The following is the gale table for this storm.

| Observatories. Jan. 13–14, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | Midngt. (12th). | S.E.byS. | 1 a.m. (13th). | S. | 47 | 2 | 6 p.m. (13th) | W. by S. | 18 | 1 p.m. (13th). | S. by W. | 68 | — |
| | | | 8 a.m. (13th). | S. | 52 | 8 | | | | | | | |
| Sandwick - | 3 a.m. (14th). | N.W. byN. | 3 a.m. (14th). | N.W. byN. | 48 | 9 | 6 p.m. (14th) | W.N.W. | 15 | 7 a.m. (14th). | N.W. by W. | 54 | The southerly wind did not reach a velocity of 30 miles at Sandwick. |
| Falmouth - | 7 a.m. (13th). | S.S.W. | 1 p.m. (13th). | S.S.W. | 40 | 3 | 5 p.m. (13th) | S.W.byW. | 10 | 1 p.m. (13th). | S.S.W. | 41 | The N.W. wind which followed was light. |
| Holyhead - | 3 a.m. (13th). | S.S.E. | 5 a.m. (13th). | S. by E. | 45 | 19 | 2 a.m. (14th) | W. by S. | 23 | 8 p.m. (13th). | S.W.byW. | 58 | — |
| Halifax - - | 3 p.m. (13th). | S.S.W. | 7 p.m. (13th). | S.S.W. | 42 | 3 | 4 a.m. (14th) | S.W.byW. | 13 | 9 p.m. (13th). | S.W. | 44 | — |
| Alnwick Castle | 9 p.m. (13th). | S.S.W. | 3 a.m. (14th). | W. | 42 | 3 | 11 a.m. (14th) | W. | 14 | 3 a.m. (14th). | W. | 48 | — |

At Aberdeen also a strong southerly wind was felt. It appears from this table that while on our south-west coasts the southerly wind was strong and that from N.W., which followed the gale, was light, in the extreme north these conditions were reversed, the chief force being experienced both in the Orkneys and the Shetlands, from the north-westward, on the morning of the 14th.

Jan. 14. At 8 a.m. the centre of the storm lay very near Sumburgh Head (*see* Fig. 6, Plate III.), where the barometer stood about 0·4 in. lower than it had done at the Irish stations on the previous morning, while at our south-western stations the mercury had risen quickly. At this time a south-easterly gale had set in on the southern coasts of Norway and at Fanö, while a strong north-westerly gale was blowing at Sandwick and Sumburgh Head, where the south-easterly breeze had previously existed. On the Irish and English coasts the wind had moderated and veered to W., and to N.W. in the Bay of Biscay. Temperature fell considerably in the United Kingdom. Rain had been general, very heavy in Scotland, and lightning had been seen at Valencia, but the weather was now clearing. In the meantime pressure was giving way over France, though over the southern parts of the Mediterranean it was rising very slowly.

Jan. 15. The conditions described above did not last long, for the barometer had again been falling somewhat in Ireland all night. At 8 a.m. the *relative* distribution of pressure was remarkably similar to that of the 10th. The highest readings were over France, the gradient from Paris to Cuxhaven being about 3, while from

Plymouth to Greencastle it was nearly 5. The wind had returned to S.W. at all our western stations, and subsequently did so on most of our other coasts. In the night it had blown strongly in the south of Ireland, the velocity exceeding 40 miles at Valencia for a short time, and reaching 30 to 35 miles at Holyhead in the evening; but the whole disturbance proved slight so far as our coasts are concerned, and in the course of the morning the mercury was rising again in the south-westward and the wind veered somewhat. A little rain fell in the west, but in the south-east of England the weather was fine but hazy.

Jan. 16. Barometrical readings were more uniform than of late, but were highest in the south-east and lowest on our north-west coasts. A fall of the barometer had, however, set in at Valencia, extending to all parts of the kingdom by midnight, accompanied by increasing south-westerly winds which reached the velocity of 30 miles at Valencia several times, and a still greater force in St. George's Channel. Temperature rose in the south and east of England but fell elsewhere, and in most places rain fell (*see* Plate IV.).

By 8 a.m. on the 17th the conditions of pressure were those represented in Fig. 7., Plate IV., gradients being steep for south-westerly winds, which were at that time fresh to strong on all our coasts, especially in England. At Sandwick the velocity increased in a manner similar to what had occurred at our western stations on the 16th. Soon after noon the decrease of pressure became much more rapid at Valencia, while the wind rose to a strong gale on our south-west coasts and extended quickly to the other parts of the kingdom. Annexed is the gale table.

| Observatories. Jan. 17-18, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 4 a.m. (17th). | S.S.W. | 7 a.m. (17th). | S.S.W. to W. by N. | 46 | 21 | 3 p.m. (18th) | W. by S. | 35 | 2 p.m. (17th). | S. | 56 | Lull to 34 miles for 1 hour at 7 p.m. 17th, when the wind shifted to W. |
| Glasgow | 8 a.m. (18th). | W.S.W. | 11 a.m. (18th). | S.W.byW. | 41 | 3 | 6 p.m. (18th) | W.S.W. | 10 | Noon (18th). | S.W.byW. | 42 | A strong breeze from S.W. was recorded till 3 a.m. 19th. |
| Sandwick | 6 p.m. (18th). | W. | — | — | — | — | Midnight (18th). | S.W. by S. | 6 | 8 p.m. (18th). | W. | 37 | Wind then backed to S.S.W., and blew freshly during next day. |
| Falmouth | 5 a.m. (17th). | S. by W. | 11 a.m. (17th). | S.S.W. | 43 | 15 | 7 a.m. (18th) | W. by S. | 26 | 8 & 9 p.m. (17th). | S.W. | 50 | — |
| Holyhead | 9 p.m. (16th). | S. by E. | 10 p.m. (16th). | S. | 43 | 6 | Midnight (18th). | S.W. by S. | 51 | 10 & 11 p.m. (17th). | S. | 60 | At this station the disturbance noticed on the night of 16th and early in the morning of the 17th, and the more general gale of the 17th–18th, are merged into one continuous gale. |
| | | | 11 a.m. (17th). | S. by W. | 48 | 26 | | | | | | | |

| Observatories, Jan. 17-18, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Stonyhurst - | 7 p.m. (17th). | S.S.W. | 11 p.m. (17th). | S. by W. | 44 | 5 | 2 p.m. (18th) | W.S.W. | 19 | 11 p.m. (17th). | S. by W. | 49 | A fresh breeze from the southward had been registered several times earlier on the 17th. |
| Halifax - | 8 p.m. (17th). | S. by W. | — | — | — | — | 7 a.m. (18th) | S.W.byW. | 11 | 11 p.m. (17th). | S. by W. | 47 | This station also recorded fresh winds as at Stonyhurst on the 17th. Velocity of 40 miles slightly exceeded at 2 and 3 a.m. on 18th also. |
| Alnwick Castle | 7 a.m. (18th). | S. by W. | 7 a.m. (18th). | S. by W. | 47 | 19 | 5 a.m. (19th) | S.W. | 22 | 9 a.m. (18th). | S.W. | 60 | —— |
| Kew - - | Noon (17th). | S. by W. | — | — | — | — | 4 a.m. (18th) | S.W. | 16 | 9 p.m. (17th). | S.S.W. | 39 | —— |
| Yarmouth - | 1 p.m. (17th). | S. by W. | — | — | — | — | 5 a.m. (18th) | S. by W. | 16 | 10 p.m. (17th). | S. by W. | 39 | —— |

Over Ireland the gale blew with great fury in the ensuing night, though at Armagh velocities of only 30 to 36 miles an hour were recorded. At Aberdeen fresh S.S.E. to S.W. breezes prevailed on the 18th.

The gale was felt more or less in all parts of the United Kingdom, and though it did not extend to our north-east coast till the morning of the 18th, it then blew with great violence, reaching 60 miles an hour at Alnwick Castle.

Rain fell generally, but not *very* heavily, though more than half an inch was reported from some of our north-western stations, with hail in some places. Thunder and lightning occurred at Stonyhurst in the afternoon. The continuity and regularity of the barometric fall for 48 hours, and the unusually low readings reached, are worthy of note; and in fact the depressions experienced throughout the month were very deep, and the storms occasionally violent. The minimum was very clearly defined everywhere, and was reached—

| | | |
|---|---|---|
| At Valencia - - | at about | 6 p.m. 17th. |
| Falmouth - - | „ | 9.30 p.m. 17th. |
| Armagh - - | „ | 1.30 a.m. 18th. |
| Stonyhurst and Kew - | „ | 2 a.m. „ |
| Aberdeen - - | „ | 8 a.m. „ |

At Glasgow the curve became indistinct for a few hours near the time of the minimum —which is consequently lost.

Jan. 18. At 8 a.m. the centre of the storm lay over the north of Scotland (*see* Fig. 8, Plate IV.). Pressure was below 29 inches at all but the southern stations, and in the north of Scotland it fell almost to 28 inches at the sea level. The gradient from Scilly to Holyhead was 0·10 in., and from Holyhead to Leith it was as much as

0·17 in. per 50 miles. Westerly and southerly gales were blowing on all the coasts of Great Britain and over the north of France, while southerly gales were reported from Denmark, and south-easterly from the south of Norway. In the west of Ireland the gale (which had veered to N.W. in the night) was now moderating, and during the day the weather improved generally as the barometer rose.

Jan. 19. A considerable rise of the barometer had taken place everywhere but in the south and west of France, especially in Scotland, where, however, though the recovery had exceeded 0·6 in. since the previous morning, readings were still below 29 inches. In the south of France a decrease occurred which extended in a slight degree to the south-west of our islands, temporarily interrupting the recovery of pressure there, as is shown by the Falmouth and Valencia curves for the night of the 18th–19th. Gradients were now slight over France, the Netherlands, and the greater part of England, but were steep in the north (Fig. 9, Plate IV.). Temperature had fallen again everywhere—especially in France and Holland, where it was lowest—although southerly and south-westerly winds still prevailed everywhere. Showers of rain had fallen in most places, hail on our south-west coasts, and a bright aurora had been seen at Thurso. The sky had since begun to clear, though the sea kept rough in the south-west. The rise of the barometer now proceeded until the 20th, being most rapid in the north.

On this day a serious disturbance seems to have crossed Spain, as "a hurricane with showers of hail" was reported from Corunna.

At 8 a.m. on the 20th the distribution of pressure was remarkable. It was comparatively high (about 29·8 ins.) in two distinct regions, viz., over the Skager Rack and the north of Spain. Between these two regions of high barometer lay a broad band of lower pressure, terminating at its northern extremity in yet lower readings, which *apparently* formed part of a depression far away to the northward and north-westward. Temperature was uniformly low, and light variable winds were general, except in the west of France, where a moderate to strong northerly breeze was reported. The weather was cloudy, with rain in the south-east of England, and a great deal of fog was reported.

Jan. 21. Very little change in barometrical readings had occurred on our coasts. The recovery noted on the 19th had ceased, but over Germany, the North Sea, France, and the Mediterranean a brisk rise had taken place, while in the south-west of the British Isles and at Corunna a diminution had set in, which commenced at Valencia before midnight on the 20th. This was accompanied by a shift of wind to S.E. both there and over the Bay of Biscay, which at Falmouth freshened to between 30 and 37 miles an hour in the afternoon. A shallow depression showed itself at the mouth of the English and St. George's Channels. The sky had become overcast in the south of England, but was less cloudy elsewhere, though thick fogs were experienced in many

places. In Dublin a very dense fog was reported at 9 p.m. In the extreme north pressure was considerably lower than in Germany; and thus it happened that the wind remained westerly in North Britain, and attained a velocity of 40 miles an hour from W.S.W. at Sandwick by 7 a.m., while in Norway strong south-easterly breezes were felt.

Jan. 22. The deficiency of pressure in the north was becoming less marked, while the fall of the barometer in the south had continued, and extended to all parts of the Bay of Biscay, France, and England, producing south-easterly and easterly winds, as had occurred in the south-west on the previous day. The lowest readings were now on our south-west coasts, being about 0·6 in. lower than those in Denmark. In the west of France and south-west of the United Kingdom the wind freshened a little, without change of direction, reaching a velocity of 40 miles from E. at Holyhead in the evening, and continuing to blow a strong breeze from the south-eastward at Falmouth. With the advance of the day the barometer fell faster in the west, and in the night the centre of a very extensive depression showed itself over the south of Ireland and St. George's Channel. Rain fell generally, and vivid lightning was seen at Nairn between 6 and 7 p.m.

At 8 a.m. on the 23rd the depression lay over our south-west coasts, *see* Fig. 10, Plate V. The only readings which were not lower than on the previous morning were those in Norway, and the fall had exceeded 0·7 inch over the Irish Sea. The gradient from Rochefort to Cork was 7 for south-westerly winds, from the Helder to the same place it was nearly the same for southerly winds, while from Norway across Scotland to the north of Ireland it was nearly 9 for south-easterly winds. Temperature had risen everywhere, especially in the north. The circulation of wind round the central area was complete. A moderate south-westerly gale blew in the west of France, a fresh S.S.W. gale at Portsmouth, a moderate south-easterly gale at Aberdeen, easterly gales at Fanö and Sumburgh Head, while moderate to strong breezes occurred elsewhere. The chief velocities registered (in addition to those given in the table a little further on) were W.S.W. 25 to 37 miles at Falmouth during the morning of the 23rd, S.S.E. 31 miles at Kew at 9 and 10 a.m., south-easterly 40 to 42 miles at Yarmouth about noon, E.S.E. 28 miles at Halifax at 3 p.m., and S.W. by S. 31 miles at Holyhead at 5 p.m. (when the centre had travelled to the north-westward of that position, and at which time S.E. 33 miles was registered at Alnwick Castle). During the day the wind rose to a gale on our north-east coasts also, and at 6 p.m. the centre of the disturbance lay over the north of Ireland, *see* Fig. 11, Plate V. Fresh complications were now observed. The minimum readings caused by the depression just described were reached at—

Valencia and Falmouth at 6 a.m., 23rd.
Kew - - at 1 p.m.
Stonyhurst - - at about 4 p.m.
Aberdeen - - at 3 a.m., 24th.

But at the other observatories the disturbance became so mixed up with what followed that each barogram represents only one continued concavity, commencing on the 21st, attaining its lowest point on the 23rd and 24th, and ending on the 27th.* On the south and east coasts of Great Britain, however, after a slight recovery for a few hours the barometer again fell with extreme suddenness and rapidity, the change first setting in at Falmouth at 4 p.m. and Kew at 8.30 p.m., extending to Stonyhurst by 11 p.m. and Aberdeen the next afternoon. A new and deep but not very extensive depression advanced rapidly from the south-south-westward, its centre passing between Falmouth and Kew. The lowest readings† recorded were—

Falmouth, 28·424 ins. about midnight (23rd).
Kew, 28·336 ins. at 4 a.m. (24th).
Stonyhurst, 28·425 ins. about 7 a.m. (24th).
Aberdeen, 28·444 ins. at 4.30 p.m. (24th).

At Plymouth our observer (Mr. Merrifield, F.R.A.S.) took the following readings,— 28·32 ins. at 1 a.m., and 28·33 ins. at 2 a.m., 24th. During the whole of this time the barometer was still falling in Ireland and the west of Scotland also, but much less rapidly.

Jan. 24. Two depressions are shown on the chart for 8 o'clock this morning; the one (which had advanced over England in the night as has just been described) lying close to Scarborough; the other (the larger and more general disturbance) being to the westward of the Irish coast, *see* Fig. 12, Plate V. At Scarborough the reading was below 28·3 ins. (at the sea level), and at Valencia below 28·4 ins., while between these places there was a band where pressure exceeded 28·5; but the *highest* readings were in the south of France. Gradients on the eastern and southern sides of the more easterly disturbance were very steep; that from Brussels to Yarmouth was 16, and across the North Sea from Fanö to Scarborough it was 14. The circulation of the wind round the central area was complete, being easterly on our northern coasts, north-westerly at Liverpool, south-westerly at our south-eastern and the French stations, southerly and south-easterly over the North Sea. Though it had blown a severe gale on our south and south-east coasts in the night, the chief violence of the wind was experienced over France, the Netherlands, and the North Sea, while on our north-west coasts there was very little wind indeed. At the same time in Ireland and St. George's Channel the wind (under the influence of the western depression) was south-westerly,

* The absence from these curves of any sign of the advance of a *new* disturbance on our western coasts would *tend* to show that the western depression noticed on the morning of the 24th *may* have been a continuation of the one which passed over Ireland on the 23rd, only that it had become more marked; and that but for the sudden appearance of the eastern depression in the night of the 23rd–24th, the recovery from the minimum at each of the English observatories and Aberdeen would have been as regular as at Armagh and Glasgow.

† These readings are all reduced to 32° F. at the mean sea level.

and continued light until, its companion storm having passed off, gradients became steeper in the west. In the following table the details of wind grouped in Part I. appear to belong more to the eastern of the two depressions, while those in Part II. are evidently the result of the western.

| Observatories. Jan. 23–24, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Part I. | | | | | | | | | | | | | |
| Aberdeen - | 3 a.m. (23rd). | S.E. by S. | 8 a.m. (23rd). | S.E. | 43 | 5 | 11 p.m. (23rd) | S.E. by E. | 20 | 9 a.m. & 6 p.m. (23rd). | S.E. | 45 | This gale evidently commenced with the depression noticed in the S.W. on the *morning* of the 23rd, and probably belongs almost entirely to that disturbance. |
| | | | 5 p.m. (23rd). | S.E. by S. | 42 | 3 | | | | | | | |
| Sandwick - | 10 a.m. (23rd). | E.S.E. | 2 p.m. (23rd). | E.S.E. | 42 | 4 | 10 a.m. (24th) | S.E. | 24 | 3 p.m. (23rd). | E.S.E. | 44 | Do. do. do. |
| Halifax - | — | — | — | — | — | — | — | — | — | — | — | — | The wind reached a maximum velocity of 32 miles from N.W. by W. at 10 a.m. 24th, at which time the wind at Alnwick Castle was light and "backed" right round the compass. |
| Kew - - | 4 a.m. (24th). | S. | 4 a.m. (24th). | S. | 46 | 6 | 10 a.m. (24th) | S.W. by W. | 6 | 5 a.m. (24th). | S. by W. | 52 | —— |
| Yarmouth - | 2 a.m. (24th). | S.E. by S. | 4 a.m. (24th). | S.E. | 42 | 6 | 2 p.m. (24th) | S.W. | 12 | 4 & 5 a.m. (24th). | S.Ely. | 48 | Wind again freshened to S.S.E. 32 miles at 1 p.m. on 25th for 1 hour only. |
| Part II. | | | | | | | | | | | | | |
| Falmouth - | 11 a.m. (24th). | S.W. by S. | — | — | — | — | 10 p.m. (24th) | S.S.W. | 11 | 7 & 8 p.m. (24th). | S.S.W. | 40 | For 2 hours only. |
| Holyhead - | 4 p.m. (24th). | S. | — | — | — | — | 6 a.m. (25th) | S.S.E. | 14 | 10 p.m. (24th). | S.S.E. | 40 | For 1 hour only. |

By 6 p.m. (24th) the western depression had advanced eastwards and lay over the south of Ireland, while the eastern one had travelled northwards and was off the east coast of Scotland. The actual minimum at Valencia was lost from the trace becoming faint. The barometric curve at Falmouth shows a slight *additional* concavity between 11 a.m. and midnight, accompanied by a marked increase of wind from S.S.W., and the southerly wind increased in strength all along our southern coasts in the evening, reaching the force of a gale in the night, after which barometer now rose generally.

Jan. 25. A considerable improvement had taken place everywhere, though the weather was far from being settled. Of the two systems of wind noticed yesterday the more eastern one had passed away northwards beyond the area of observation,

while the one which was over the south of Ireland at 6 p.m. now lay over the south east of that island and St. George's Channel, and was being filled up (*see* Fig. 14, Plate V.). Pressure was increasing everywhere except in the south of Europe. Gradients were, however, still rather steep over France, so that the prevailing southerly and south-westerly winds were rather strong there, as well as on our own south-east coasts, and the south-easterly gale held still in Norway. In these islands the wind circulated completely round the lowest pressure, being northerly in Ireland, westerly in the Channel, southerly in the east of England, and easterly in the north, and was generally moderate. Temperature fell fast in France, Holland, and the north of Scotland, but a tendency to rise was shown elsewhere. The weather improved a little, though showery in most places, and the sea continued rough at Scilly. The recovery of pressure proceeded on all our coasts till the 27th, and in some parts still longer.

On the morning of the 26th the depression had travelled eastward and lay over England, its central area enlarging but becoming shallower (*see* Fig. 15, Plate VI.) The circulation of the wind round it also continued, and owing to the rapidity of the increase of pressure in the extreme west gradients became rather steep again, and the northerly winds on our western coasts were strong for some time. At Holyhead a fresh breeze was registered from 8 a.m. to 6 p.m., the maximum being 41 miles at 1 p.m.; at Falmouth a similar force was felt in the evening and following morning; and though at Valencia it was reported to have blown extremely heavily both in the previous night and during the day, the anemometer, being somewhat sheltered from N. and N.W. winds by high land lying to windward, only registered 30 to 36 miles an hour from that quarter. Elsewhere the wind was light. Temperature recovered itself in Scotland and was wonderfully uniform; but rain was general in the morning.

Jan. 27. The area of lowest pressure had now reached the Netherlands, but a greater increase having occurred on its western and north-western sides (*i. e.* over our islands) than at its centre, the gradients were still sufficiently steep to give us a moderate northerly wind on all our coasts, and north-westerly breezes in the Bay of Biscay; while in the extreme south of Norway (where a *tendency* towards the formation of an anticyclone was observed) fresh northerly winds were reported. Temperature fell somewhat at most stations, and though the sky continued cloudy the weather was finer than of late, and the sea went down slowly where it had continued rough.

Further change was, however, approaching us from the westward, and at noon the barometer recommenced falling at Valencia, accompanied by a rise of temperature and the veering of the wind through N. and E. towards S.

Jan. 28. Though the mercury had fallen nearly a quarter of an inch at Valencia and the decrease had extended considerably, it still rose at the south-eastern stations.

A sharp frost had set in over Scotland in the night, and throughout England and France temperature fell considerably, while in Ireland the fresh southerly winds had produced increased warmth. Variable airs prevailed except in the west. A slight but temporary recovery of pressure now took place in the west of our islands, but was soon succeeded by a fresh fall, commencing at Valencia at 9 p.m.

On the morning of the 29th the barometer had fallen from three to four tenths of an inch in the west of Scotland, and to a less extent on our other coasts, while a rather brisk rise had taken place over the central parts of France, and an elongated anti-cyclone had formed, with its major axis lying from S.W. to N.E. Southerly and south-westerly winds had gradually extended over the United Kingdom, and had again blown strongly in the south of Ireland during the night. A rapid rise of temperature occurred throughout the country, especially in Scotland, rain again becoming prevalent in the west and north. From this diminution of pressure there was *very* little recovery anywhere, and towards evening the barometer recommenced falling in Ireland.

By 8 a.m. 30th, the barometer being lower everywhere than on the previous day, especially in the N. and N.W., the difference between the reading on our north-west and our south-east coasts began to be considerable, while uniformly high pressures were reported from France. The gradient from Dover to Holyhead was 0·07 in. for south-westerly winds, while from Holyhead to Greencastle, and from Scilly to Valencia, they were 0·09 in. and 0·08 in. respectively. Fresh to strong S. and S.W. winds were now blowing on our western coasts, moderate breezes from the same quarter at our other and the French stations, rather strong S.W. winds on the south-eastern shores of the North Sea, and very fresh easterly winds in Norway. The following table shows the details of the wind at Valencia and Holyhead, where it was strongest.

| Observatories. Jan. 28–30, 1872. | Velocity. 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 11 p.m. (28th). | S.E. by S. | 2 a.m. (29th). | S. to S.S.E. and back. | 45 | 36 | 7 p.m. (30th) | S. | 44 | 4 a.m. (30th). | S. | 59 | Velocity exceeded 50 miles from 3 to 6 a.m. 30th (inclusive). |
| Holyhead | 1 p.m. (28th). | S.S.E. | 7 a.m. (29th). | S. by E. | 43 | 8 | 1 a.m. (31st) | S. by W. | 60 | 7 a.m. (30th). | S. | 50 | Velocity occasionally reached 40 miles on the 28th. |
| | | | 4 a.m. (30th). | S. | 43 | 11 | | | | | | | |

At Armagh velocities of 30 to 36 miles occurred all the morning. At Sandwick 32 miles for one hour was recorded at 8 p.m. At Falmouth a similar velocity was recorded for the greater part of the day, and also at Stonyhurst between 11 a.m. and 2 p.m. Temperature continued to rise in our islands and Norway, especially in the

north and east, while over the north-east of France the weather was cold. In fact Aberdeen was 18°, and Christiansund was 13°, warmer than Paris.

Jan. 31. A rapid reduction of pressure had begun in the west, and the change having been slightly of the opposite character at the south-eastern and French stations, gradients became still steeper over the western parts of the United Kingdom. The conditions of pressure and wind at 8 a.m. are represented in Fig. 16, Plate VII. Frost continued over central France, while warm moist southerly gales blew over the west of our islands, accompanied by some rain and a high sea. On our other coasts the wind was moderate from about the same direction.

The depression continued to extend rapidly and produced a minimum reading at Valencia very slightly above 29·0 in., at about 9 p.m., and after a slight recovery a second decrease took place, the minimum reading from which occurred at about 4.20 a.m. on the 1st, and was below 29 inches. It is to be observed that during this temporary recovery the wind at Valencia lulled to a light breeze, first veering to S.W. and then *backing to E.*, but immediately the barometer recommenced falling the wind veered to S. and again blew hard. At most of the western and northern observatories and stations a similar complication is shown, but elsewhere only a single decrease and recovery is shown for *this particular gale.* Even at Falmouth the peculiarity is not traceable. *See* Plate VII. The following table shows the chief characteristics of the gale as registered anemometrically.

| Observatories. Jan. 31-Feb. 1. | Velocity, 30-40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 3 a.m. (31st). | S. by E. | 5 a.m. (31st). | S. by E. | 53 | 15 | 9 p.m. (31st) | W.S.W. | 18 | 2 p.m. (31st.) | S.S.E. | 61 | Velocity fell to 16 miles immediately the wind shifted to W.S.W. |
| Armagh - | 9 a.m. (31st). | S. by W. | 3 p.m. (31st). | S. by W. | 42 | 5 | Midnt. (31st) | S. by W. | 15 | 4 & 5 p.m. (31st). | S. | 44 | — |
| Glasgow - | 5 p.m. (31st). | S. | 5 p.m. (31st). | S. | 45 | 8 | 2 a.m. (1st) | S. | 9 | 11 p.m. (31st). | S. | 51 | This gale was preceded by a stiff southerly squall in the morning, after which wind backed to S.E. |
| Aberdeen - | 8 a.m. (1st). | S. by E. | — | — | — | — | 2 p.m. (1st) | S.W. | 6 | 9 a.m. (1st). | S. by E. | 40 | For 1 hour only. |
| Sandwick - | 1 p.m. (31st). | S. | — | — | — | — | 9 p.m. (31st) | S.S.E. | 8 | 6 p.m. (31st). | S. by E. | 31 | — |
| Falmouth - | 11 a.m. (31st). | S. by E. | 9 p.m. (31st). | S. | 44 | 7 | 8 a.m. (1st) | S.W. by S. | 21 | 2 a.m. (1st). | S. | 47 | — |
| Holyhead - | 5 a.m. (31st). | S. | 7 a.m. (31st). | S. | 52 | 27 | — | — | — | 9 p.m. (31st). | S.S.E. | 66 | Velocity did not fall *lower* than 30 miles before the next gale set in. |

At Aberdeen the velocity slightly exceeded 30 miles on the afternoon of the 31st, which was preceded by a squall very similar to that registered at Glasgow. At Stonyhurst,

Halifax, and Alnwick Castle it also rose to upwards of 30 miles during the night of the 31st–1st, and at Yarmouth also at 6 a.m. on the 1st. It seems doubtful whether the details in the above table registered under the head of Sandwick belong to the depression which produced the gales noted at other places, or whether (judging from the time of their occurrence) they do not belong to an earlier disturbance, which probably occasioned the preliminary squalls noted at Aberdeen and Glasgow.

At 8 a.m. on Feb. 1 the area of lowest pressure lay apparently to the westward of Scotland, and a recovery had set in on our western coasts. The wind, however, still blew hard from S.W. at the western and northern stations, accompanied by rain, which was heaviest in the north-west. On our other coasts moderate to fresh southerly breezes were reported, but a southerly gale was blowing in Belgium. In the east of France the weather was fine and clear. The recovery extended rapidly to the northward during the day, but was succeeded very quickly by a renewed fall at Valencia, the wind backing and freshening. The lowest reading from this new disturbance was reached at Valencia by 3 p.m., Falmouth between 6 p.m. and 7 p.m., Armagh at 9 p.m., Kew (where the concavity in the curve was much less marked) at midnight, Stonyhurst at 2 a.m. (2nd), and Aberdeen at 5 a.m. A renewal of the gale was produced in most places, but the wind was less severe than that caused by the previous disturbance. The principal details are given below.

| Observatories. Feb. 1st. | Velocity, 30–40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 3 a.m. (1st). | S.S.E. | 4 a.m. (1st). | S. | 51 | 4 | 4 p.m. (1st) | S.S.W. | 13 | 4 a.m. (1st). | S. | 56 | — |
| | | | Noon (1st). | S. by W. | 47 | 2 | | | | | | | |
| Armagh | 6 a.m. (1st). | S. | 8 a.m. (1st). | S.S.W. | 45 | 2 | 11 a.m. (1st) | S.S.W. | 5 | 9 a.m. (1st). | S.W. by S. | 47 | — |
| Glasgow | 7 a.m. (1st). | S. by E. | 9 a.m. (1st). | S. | 45 | 3 | 1 p.m. (1st) | S.W. by S. | 6 | 10 a.m. (1st). | S. by W. | 49 | — |
| Sandwick | 10 a.m. (1st). | S.S.E. | 1 p.m. (1st). | S. | 44 | 3 | 5 p.m. (1st) | S.W. by S. | 7 | 2 p.m. (1st). | S.S.W. | 48 | — |
| Falmouth | 1 p.m. (1st). | S. by E. | 4 p.m. (1st). | S.S.E. | 44 | 4 | 9 p.m. (1st) | S.W. by S. | 8 | 6 p.m. (1st). | S. by E. | 48 | — |
| Holyhead | 11 a.m. (1st.) | S. | 8 p.m. (1st). | S.E. by S. | 47 | 4 | 1 a.m. (2nd) | S.W. by S. | 14 | 10 p.m. (1st). | S.S.E. | 55 | — |

At Stonyhurst the velocity varied from 30 to 35 miles from S. in the morning.

Feb. 2. At 8 a.m. the lowest readings were to the north-westward of Scotland, and though the wind had moderated on nearly all our coasts it still blew hard from S.S.E. at Sumburgh Head, and reached a velocity of 30 miles at noon at Holyhead. The

barometer was rising everywhere, and though rain had been general, with hail at Roche's Point, the sky cleared considerably at all but our south-eastern and the French stations, chiefly in Scotland. Temperature fell slightly, but did not differ much from the average.

Feb. 3. The barometer stood higher on all coasts than it did on the previous morning, and the change having been greatest in Scotland, readings were much more uniform in the north than of late. A fresh diminution had, however, set in on the Irish coast since midnight, accompanied, as usual, by the backing and increasing of the wind, a rise of temperature, and renewed rainfall. The barometric fall and gale both extended quickly to the other western and northern coasts; but on referring to the Kew curves, Plate VII., it will be observed that they were little affected beyond a slight rise of temperature after 5 a.m., and our south-east coasts escaped the gale, though in some parts of Scotland it was felt severely. The following is the gale table for the time in question.

| Observatories. Feb. 3. | Velocity, 30-40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 5 a.m. (3rd). | S.S.E. | 7 a.m. (3rd). | S.E. | 46 | 8 | 8 p.m. (3rd) | S.S.W. | 15 | 11 a.m. (3rd). | S.S.E. | 54 | — |
| Sandwick | 9 p.m. (3rd). | S.S.E. | Midnt. (3rd). | S.S.E. | 50 | 1 | 1 p.m. (4th) | S. by W. | 16 | Midnight (3rd). | S.S.E. | 50 | — |
| | | | 3 a.m. (4th). | S.S.E. | 42 | 6 | | | | | | | |
| Falmouth | 11 a.m. (3rd). | S. by E. | — | — | — | — | 10 p.m. (3rd) | S.W. by S. | 11 | 9 p.m. (3rd). | S. by E. | 44 | For 1 hour only. The lull was most sudden directly the wind shifted to W. by S. |
| Holyhead | 7 a.m. (3rd). | S. by E. | Noon (3rd). | S.S.E. | 46 | 12 | 6 a.m. (4th) | S.W. by S. | 23 | 8 p.m. (3rd). | S.S.E. | 52 | — |

At Armagh the velocity slightly exceeded 30 miles an hour from S.S.E. between 3 and 7 p.m. At Aberdeen it varied from 30 to 38 miles from S.S.E. during the first eight hours of the 4th, while at Stonyhurst it was rather above 30 miles early on the morning of the same day. The recovery of pressure which succeeded this gale was tardy over Ireland but more brisk in Scotland, and the wind continued strong in the W. for some time.

On the morning of the 4th pressure varied from about 30·1 ins. on the coast of Denmark to 29·4 ins. both in the north of Scotland and the south of Ireland. Southerly winds were general, being fresh to strong in the west and north, (reaching a maximum of 50 miles at Valencia at 11 a.m.,) and light elsewhere, while fresh easterly and south-easterly winds blew in Norway. Temperature was very uniform, and showed little

change since the previous day. The barometer was very unsteady all day at Valencia, and by the next morning an extensive but rather shallow depression had formed over the west of our islands. In the evening a most brilliant auroral display was witnessed all over western Europe, and we learn from marine observations and other data that a similar display occurred nearly all over the world. A thunderstorm was reported from Valencia.

The general conditions of pressure and the prevailing strong winds at 8 a.m. on the 5th are shown in Fig. 18, Plate VIII.; from which it will be seen that there was an inch of difference between the readings on the eastern shores of the North Sea and that at Valencia. Over Russia pressure was still higher. Gradients were steepest over the North Sea and England, that from Oxö (south of Norway) to Scarborough being 0·09 in. per 50 miles. Strong southerly and south-easterly breezes were blowing along the east coasts of Great Britain, and fresh to strong E.S.E. winds in Norway, Denmark, and Holland. On our west and south-west coasts the wind was more southerly and lighter generally, but at Holyhead a strong breeze blew near mid-day, and again in the evening; while at our most north-western stations the wind drew into E. round the northern side of the area of lowest pressures. Temperature changed little and irregularly in our islands, but rose fast in the west of France. In Norway it fell and was rather low. Cloudy weather was general, with rain along our north-east coasts and at Portsmouth. During the day the wind veered south-westwards on our coasts except in Caithness, where the strength of the E.S.E. gale had increased at 2 p.m. A recovery of pressure commenced in the S.W. and N.W. in the morning, but did not extend to Scotland till the afternoon.

Feb. 6. The lowest pressures were now to the westward of Scotland, and the steepest gradient was from Oxö to Wick. From the singular manner in which the barometer, after beginning to rise generally, fell again at Armagh, Glasgow, and Aberdeen, it would *seem* as though the depression, which had apparently travelled northwards or north-north-westwards from Ireland, *extended* itself in an easterly direction as it passed the western borders of Scotland. Hence, on referring to Fig. 19, Plate VIII., it will be seen that though the gale had ceased on nearly all our coasts, and the wind had veered to S.W. in England and Ireland, with a rising barometer, yet a south-easterly gale had set in at the Norwegian stations, and strong breezes from that quarter continued on all the eastern shores of the North Sea as well as in the Netherlands. Over Russia readings were as high as 30·7 ins. On the shores of the Bay of Biscay, where south-westerly winds had prevailed on the 5th, easterly breezes now showed themselves. The rise of the barometer now became general, and towards night the thermometer fell fast in Great Britain, especially in Scotland. Rain had fallen in most places, and cloudy weather continued.

Feb. 7. The region of lowest pressure had passed far northwards and was apparently some distance to the westward of the Norwegian coast and to the northward of

Scotland. The barometer had begun to fall in Russia, and as it was rising in western Europe greater uniformity was produced. The wind fell light almost everywhere, veering to S. or S.W., except in Norway; but at Valencia it again rose to a strong breeze in the afternoon and the early morning of the 8th, at which time the barometer was unsteady in the west and at Kew. Temperature fell except in Norway, Denmark, and the south-west of our islands, and finer weather visited us, though fog prevailed in several places.

At 8 a.m. on the 8th a slight depression had formed over the south of Ireland, where the south-easterly wind increased considerably, with a recurrence of rain in the west and south of our islands. At Valencia velocities varying from 30 to 35 miles an hour were maintained all day, but the disturbance was comparatively slight, and passed off before night. Over eastern Europe readings had become very uniform, and remained so for several days. Temperature had again decreased considerably in the north of Great Britain, where frost prevailed, but elsewhere it had not changed much.

Feb. 9. During the night of the 8th–9th a new but shallow depression had shown itself in the west of Ireland. It was more extensive than that of the previous day, but its effect on pressure in the east was slight. The principal gradients were found in the west, where the wind again freshened from S. and S.E. At Valencia it attained a velocity of 40 miles an hour from S.S.E. in the evening, and at Holyhead it blew equally hard between 7 a.m. and 2 p.m., the maximum force being near noon. At Sandwick and on the Scotch coasts a similar increase occurred from the south-eastward in the afternoon, the greatest force being felt at 3 p.m. Temperature recovered very fast in Scotland, the change since 8 a.m. on the 8th amounting to 12° or 15°; but in the south-east of England and north-east of France it had fallen considerably in the night, though it rose again quickly as the day advanced. Light winds continued at all the eastern stations, and thick fogs prevailed on our north-east coast. The western deficiency of pressure then extended slowly to the eastward, chiefly on our northern coasts.

Feb. 10. The barometer stood lower than on the previous day at all but the continental stations, the change amounting to a quarter of an inch in the N. of Scotland. Over France and Denmark, however, it had risen slightly. The wind became moderate except at Sumburgh Head, where it blew freshly from S.S.E., while at Falmouth the velocity increased to slightly above 30 miles an hour from S. about mid-day. Rain had been general on our western and northern coasts, with hail at Thurso, and cloudy weather continued, with fog in the north-east. Pressure was now rising again over Russia.

Until after 8 a.m. on the 11th there was very little change recorded at any of our stations, except that with a slight fall of the barometer at Falmouth the wind began to back towards S.E. on our south-west coasts, and freshen considerably, after first

lulling, almost to a calm. The velocity exceeded 30 miles from 6 p.m. 11th to 8 a.m. 12th, reaching a maximum of 40 miles from S.E. at 7 a.m. At Valencia 33 miles from E.S.E. was reached at 2 p.m., while at Holyhead it varied from 30 to 40 miles between 5 a.m. and 6 p.m. (11th). Shortly before noon pressure began to decrease at Valencia, and temperature rose. The weather was still cloudy, and rain began to fall in the south-west and north as the day wore on.

Feb. 12. The reduction of pressure in the south-west had continued very briskly, and extended to all but the northern parts of Scotland and the north-eastern shores of the North Sea, where the mercury had risen slightly. At 8 a.m. the centre of a moderately deep depression had advanced to the south-west coast of Ireland, *see* Fig. 20, Plate IX., the minimum reading occurring at Valencia somewhere about 9 or 10 a.m. Unfortunately from various causes the barograms for this period are more or less defective for Valencia, Armagh, and Glasgow. Temperature changed little; but fresh to strong south-easterly winds set in on all our coasts and over the North Sea, with rain in the south-west; whilst south-westerly breezes were blowing in the Bay of Biscay. The velocity rose to 38 miles from E.S.E. at Valencia at 2 and 3 a.m., and to above 40 miles from S.S.E. at 10 a.m.; at Glasgow it varied from 27 to 34 miles in the afternoon, at Aberdeen it exceeded 30 miles (from S.S.E.) after 11 a.m., and at Sandwick it rose above 30 miles at 5 a.m., continuing strong for about two days. During the day a S.E. gale set in on our north-east coast, and a recovery of pressure took place in the south-west. The effect of this disturbance was manifest throughout western Europe, but in Russia readings remained high.

Feb. 13. The relative distribution of pressure at 8 a.m. differed little from that on the 12th, though a slight increase had occurred in all places, *see* Fig. 21, Plate IX. The S.E. wind continued to blow hard on the Danish coast. At Sandwick, as before stated, the velocity exceeded 30 miles all day, while at Aberdeen it rose to 40 miles from S.E. by S. at 5 a.m., and at Valencia it was from 30 to 42 miles about noon. An E.S.E. gale was felt on the north-east coast of Ireland also. Elsewhere the wind moderated without any material change in its direction. Temperature again fell in most places, chiefly in the north, while very cloudy and wet weather continued in the west, with fog in the east of our islands.

Feb. 14. The barometer having risen a little in the west of our islands, while it had fallen slightly on the eastern shores of the North Sea, readings became more uniform, but there was still a difference of 0·82 in. between those at Oxö and Roche's Point, the gradient being very uniform. The changes of temperature were insignificant; and though the wind lulled in most places where the gale had prevailed on the 13th, yet in the Shetlands and Orkneys it continued strong. At Sandwick it remained rather above 30 miles from S.E. all day, and blew freshly at Falmouth, where it reached 37 miles from S.S.E. at 8 a.m., and from S.E. by S. at midnight. Very little further

change was reported in the British Islands. Over Russia slightly diminished pressure was observed. In the evening a thunderstorm occurred in Paris, and lightning was seen at Portsmouth.

Feb. 15. The mercury had risen briskly over Ireland but fallen elsewhere, chiefly in the north-east of France. The lowest reading was at Scilly (*see* Fig. 22, Plate X.), being 0·80 in. lower than that at Oxö, and a slight depression was found at the mouth of the English Channel. The wind again increased in most places, rising to a gale from E. at Fanö and Cuxhaven, from S.E. at Shetland, and extending as a fresh breeze of 30 miles an hour to Yarmouth at 7 and 9 a.m. At Sandwick the wind rose to above 30 miles from S.E. at 5 p.m. and continued so all day. In Norway it became more easterly, and a very hard frost set in both there and in Denmark. In our islands temperature showed little change, the weather continuing cloudy, with rain in the west and north. Later in the day the western increase of pressure extended south-eastwards to the west of France, and was succeeded by a decrease at our north-western stations.

At 8 a.m. on the 16th the distribution of pressure was remarkable. A region of high pressures, exceeding 30·5 ins., lay over the Gulfs of Bothnia and Finland, and a second, but less marked, over Spain. Between these two regions of high barometer was a band of lower readings terminated at its north-west extremity by a depression which lay to the westward of Scotland, and at its other extremity by another depression, lying apparently over Belgium and the north-east of France, *see* Fig. 23, Plate X. The wind was consequently very variable in direction, but an easterly gale prevailed on all the eastern shores of the North Sea, a strong north-easterly breeze in Holland, drawing round to a moderate northerly wind on our south-east coasts, while south-easterly gales were reported from the east of Scotland, and moderate westerly winds at the entrance of the English and St. George's Channels. At Aberdeen the velocity was slightly above 30 miles all the afternoon; and at Orkney, where the wind freshened on the previous day, it exceeded 40 miles from 9 a.m. to 7 p.m. Owing to the advance eastwards of the north-western depression the barometers in the north of the kingdom fell as the day passed (*see* Plate X.), and the gale became very severe at Sumburgh Head; while, as that in the south-east travelled from us, the barometer rose at Kew. Temperature fell in the east and south-east, but rose several degrees at the Norwegian stations. The weather remained very cloudy, with rain in places, and lightning was seen at Ardrossan at night. At 2 p.m. the barometer was falling at Skudesnaes, and at Valencia by midnight.

Feb. 17. The depression in the north-west continued to advance slowly to the eastward, and all the western and northern barometers fell slowly, but over the north of Russia readings continued high. From this time until the 21st the changes of pressure and temperature throughout the north-west of Europe were very gradual. The baro-

meter continued to fall, chiefly at the more northern stations, until the 18th, and then rose again rather unsteadily. Temperature varied little beyond the ordinary diurnal range; and while at the more southern stations the wind was *generally* moderate from W. and S.W. (but fresh on the 18th), in the north it drew round to S.E., and continued to blow hard at Sumburgh Head till the 19th. Occasionally this strong wind extended to the north and east coasts of Scotland also. The greatest velocities registered in the interval were slightly over 30 miles from S.W. by S. at Holyhead on the 17th; about the same at Falmouth between 4 a.m. and 6 a.m. on the 18th, near which time the velocity was rather above 30 miles an hour from S.S.E. at Sandwick; and on the 20th a similar freshening from S.W. by S. took place again at Holyhead. The weather continued rainy in the west and north, sleet showers were reported from Sandwick on the 17th, a heavy thunderstorm at Ardrossan on the 18th, and hail on our north-west coasts on the 19th and 20th. In the south and east the weather was finer after the 18th. A very sharp ground frost occurred in London on the night of the 19th, though at 4 ft. from the ground the temperature in the shade did not fall below 40°. A similar frost was reported from Paris the next night.

Feb. 21. At 8 a.m. the barometer was still rising at all stations, and pressure, though lowest in the north, was comparatively uniform. Light westerly winds passed over our islands, and drew round to S. on the eastern shores of the North Sea. The weather, though cloudy and misty in the west and north, was fine elsewhere, with fog in some parts of France. At about 10 a.m., however, the barometer began to fall at Valencia, and the change was quickly repeated at the other stations, while the wind backed towards S. and increased fast, with a rise of temperature and more sea. The fall continued till next morning.

At 8 a.m. on the 22nd a depression lay over the west of Ireland, but the barometric fall had not extended to the east of Scotland, where too the weather was still fine. Readings varied from 30·3 ins. at Paris, to 29·6 ins. at Valencia, and the gradient from Pembroke to Cork was 0·09 in. per 50 miles. Southerly and south-westerly winds were general, blowing strongly in the south of Ireland and St. George's Channel. At Falmouth the velocity exceeded 30 miles from 5 a.m. to 4 p.m., and at Holyhead it was above 40 miles from 11 a.m. to 3 p.m., the maximum being 49 miles at 3 p.m. During the day the disturbance travelled north-eastwards, so that at Sandwick 30 miles was exceeded from E. by S. between midnight of the 22nd and 3 a.m. 23rd; and while a recovery of pressure set in over the west of our islands the northern barometers fell briskly. Between 3 and 5 p.m. a sudden but temporary shift of wind, from S. to S.W. and back, occurred locally at Falmouth, accompanied by very heavy rain and a fall of a few degrees in temperature. The total rainfall at this observatory during the day was 1·16 in.

On the morning of the 23rd the centre of the disturbance lay to the northward of Scotland. Temperature rose in the east and north. The wind fell light, and veered

to W. on our western coasts, where the temperature decreased temporarily. The barometer had, however, again been falling for several hours at Valencia, where the wind backed to S. again and increased, and the weather became warmer. The rate of fall was then accelerated, becoming rather rapid at noon, and extending quickly, while the wind became strong in the south-west. At Valencia the velocity reached 48 miles from S.E. at 7 p.m., and the same from S. at 11 p.m. At Falmouth it exceeded 30 miles from S. by E. between 9 p.m. and 11 p.m. It should be observed that at Aberdeen hardly *any* recovery of pressure succeeded the depression of the 22nd as it passed off, the new disturbance apparently extending with sufficient rapidity to mask it. The weather became showery, and bright aurora was seen at Thurso and Sandwick in the evening.

Feb. 24. At 8 a.m. a large but not very serious disturbance lay near our western coasts, the steepest gradients being for southerly winds over Great Britain. Moderate southerly and south-westerly breezes prevailed at the southern stations, drawing round to S.E. over the northern parts of the North Sea, and to E. on our north-west coasts. At Valencia the wind increased after 8 a.m. to 46 miles from S. At Falmouth it exceeded 30 miles from S.S.W. all the afternoon, while at Holyhead it had been blowing strongly all the morning, reaching a maximum of 42 miles from S.S.E. at 7 a.m. At Sandwick also the velocity exceeded 30 miles after 2 p.m. The weather was overcast except in the extreme north, and rain fell in the west and south. The barometric fall continued very slowly everywhere, and gradually extended eastwards and south-eastwards towards Holland and Belgium.

On the morning of the 25th conditions were *very* similar to those on the 24th, only the disturbance had advanced rather further eastwards. As, however, pressure had increased somewhat in Scotland and the west of Norway, gradients became steep for easterly winds at our northern stations, so that during the night an easterly gale, with rain, had set in on those coasts. At Sandwick the velocity exceeded 30 miles from about E. by S., between 3 p.m. 24th and 9 p.m. 25th, exceeding even 40 miles during the greater part of the daytime of the 25th. It should be noted, too, that at Valencia the wind rose again from S. by W. after 7 p.m. 24th, and blew with a velocity of about 48 miles at 2 a.m., while at Falmouth and Holyhead it rose to over 30 miles from the southward at about 10 a.m. 25th, and continued strong for many hours, especially at Falmouth. The weather was very unsettled everywhere, snow falling in the south of Norway, and rain at all our stations; hail at Helstone. During the day the whole of the depression disappeared very suddenly, *apparently being filled up from the north-westward.* Thus the western and northern barometers rose rapidly, while those in the south of England changed very little. The barogram at Falmouth points to some local disturbance passing the observatory about 10.40 p.m., accompanied by heavy rain, and the rapid veering of the wind from S.W. to W. and then slowly to N. This local disturbance is apparently the same as that found near Portsmouth next morning.

Feb. 26. A very different distribution of pressure appeared from that observed on recent days. The barometer had fallen somewhat over Norway and Denmark, and to a less extent over France, while at our western stations (as before stated) it had risen rapidly. Readings varied from 30·04 inches at Biarritz and 29·94 at Thurso to 29·48 at Helder and Portsmouth. Near these latter stations two slight local depressions were found, lying in a band which extended across Holland, the south of England, and the mouth of St. George's Channel, and in which pressure was low compared with that in neighbouring places. Easterly or north-easterly winds (strong at Leith) blew over the North Sea and nearly the whole of our islands, while fresh to strong westerly breezes were reported from France. Rain, which had been general except on our north-west coasts, still fell in the north-east of Great Britain, and France; temperature fell everywhere, and overcast skies were reported generally. The sea ran high in the Bay of Biscay. As the day wore on the barometer rose rapidly in the south and east, the wind freshened from N.E. again on our east coast, whilst the band of low pressure disappeared. At Alnwick Castle the velocity rose to 29 miles from E.N.E. at 8 a.m., at Yarmouth it exceeded 30 miles from N.E. by N. from 3 p.m. to 11 p.m., while at Holyhead also it rose to more than 30 miles from N.E. between 1 p.m. and 5 p.m., the maximum being 38 miles at 3 p.m. At night a brilliant aurora was seen at Thurso.

Feb. 27. At 8 a.m. an anticyclone, whose maximum pressure slightly exceeded 30·2 inches, lay over the North Channel, Irish Sea, and north of England, whence readings decreased to 29·8 in. at Christiansund, and 29·7 in. in the south of France. Temperature had again fallen generally and was very low, especially on the eastern shores of the North Sea. Westerly winds prevailed in Norway, and light northerly breezes at the eastern stations generally, drawing round to N.E. in the west of France, and to E. in the south of our islands. At Paris a very fresh *northerly* wind was reported. The sky, though still cloudy, had cleared a good deal in our islands, but was overcast in France, with fog in the south-west and south of the country. During the day the barometer ceased rising at all the observatories, and a diminution commenced which continued everywhere till the 29th.

Feb. 28. The mercury had descended very briskly in the west and north of the United Kingdom and Norway; while in France it had risen, and over the north-east of that country and in Belgium the maximum pressures, slightly exceeding 30·2 ins., were now found. Southerly and south-easterly winds were again prevalent on our coasts, blowing strongly in the west. At Valencia 41 miles from S.E. by E. was reached at 1 a.m., and throughout the day the velocity exceeded 30 miles, while the wind veered to S.S.W. At Falmouth very fresh winds from S. by E. prevailed between 11 a.m. and 6 p.m. Fresh south-easterly breezes prevailed in the west of France and moderate westerly winds in Norway. Temperature began to rise again

everywhere, commencing in the west, the sky became cloudy on our coasts, and rain set in on the south coast of Ireland and at Christiansund. Over central France the weather cleared. The decrease of pressure now continued rapidly in the north-west and north, and extended quickly to the southward.

At 8 a.m. on the 29th the highest pressures (still about 30·2 ins.) were in the south of France, where the barometer had risen; the difference between the readings at Lyons and Thurso exceeded an inch. Fresh S.W. and W.S.W. winds blew in all parts of the country, reaching the force of a moderate gale in the west, and drawing into S. in Denmark and Norway, while light southerly winds blew in the north-east of France. At Valencia the wind, which had continued fresh, rose to 46 miles from S.W. by S. at 10 a.m., but fell light after 3 p.m. At Glasgow a maximum of 30 miles from S.W. occurred at 6 a.m. Fresh south-westerly breezes blew at Falmouth all day, 41 miles being reached at 3 p.m., and 40 miles at 9 p.m. Holyhead experienced fresh to strong breezes till 6 p.m., with a maximum of 41 miles at 1 p.m.; and even at Alnwick Castle 30 miles was slightly exceeded at 4 and 5 a.m. Overcast rainy weather prevailed on all coasts. Rain fell all day at Stonyhurst, and was very heavy between 5 and 7 p.m. Temperature rose rapidly except on the eastern shores of the North Sea. In the morning a slow recovery of pressure set in at Valencia, extending to all the other observatories by the next morning, and was rapid at the northern stations.

On the continent the changes of pressure now became very sudden and extensive.

March 1. The barometer had risen rapidly in the north of our islands and the west of Norway, while over the Gulfs of Bothnia and Finland, as well as the Baltic, an equally sudden diminution had occurred, extending in less degree to the Netherlands and most of the French stations. The lowest readings were in Lapland and Scandinavia, but a shallow depression still lay on our north-west coasts. Moderate west-south-westerly breezes prevailed over the south of England, France, Holland, and Denmark; but in Norway and the north of Britain a northerly breeze was reported, which reached the force of a gale at Christiansund and blew freshly at Skudesnaes. At the western stations the wind was very variable. Rain had fallen generally, chiefly in the west; and overcast weather continued, with rain in Belgium, and fog in Ireland and the south-west of England. At night bright aurora was seen at Thurso.

March 2. A most sudden and unusual change had taken place, almost entirely reversing the general conditions over the north-west of Europe. Readings had remained low in Russia, but in the south of Norway, Denmark, and Germany the barometer had risen with *great* rapidity, the change extending in less degree even to our own stations except those in Ireland. It thus happened that at 8 a.m. pressure was highest in the south and east, and lowest in the west. The W.S.W. wind in France fell light, the northerly winds in Scotland disappeared, and light southerly breezes became prevalent except in

the Netherlands and Denmark. As the barometer continued to fall in the north and west during the day, but rose in the south-east, the southerly breeze became strong on our western and northern coasts, and blew a gale in several places, as will be seen by the following brief table:

| Observatories. March 2, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity, Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 3 a.m. (2nd). | S.E. by S. | 8 a.m. (2nd). | S.S.E. | 45 | 6 | 6 p.m. (2nd). | S.S.W. | 15 | 11 a.m. & Noon, (2nd). | S. | 50 | — |
| Sandwick - | 7 a.m. (2nd). | S. by E. | — | — | — | — | 1 a.m. (3rd). | S.W. by S. | 18 | Noon to 2 p.m. (2nd). | S.S.E. | 40 | A lull to 25 miles as the wind veered westward. |
| | 3 a.m. (3rd). | W.S.W. | — | — | — | — | 7 a.m. (3rd). | W.S.W. | 4 | 4 a.m. (3rd). | W. by S. | 40 | |
| Holyhead - | 10 a.m. (2nd). | S. by E. | 2 p.m. (2nd). | S. by E. | 41 | 3 | 10 p.m. (2nd). | S.S.W. | 12 | 4 p.m. (2nd). | S. | 42 | — |

At Armagh the velocity increased to 29 miles from S. by E. near the middle of the day, while at Glasgow and Aberdeen it exceeded 30 miles from the same direction in the afternoon and evening, but at Falmouth nothing beyond 28 miles was recorded. The disturbance, however, travelled towards Norway, and a recovery set in at our stations. The weather was rainy in the west and south.

March 3. A large anticyclone, whose highest pressure exceeded 30·4 ins., lay over France and Germany. The barometer had fallen fast in the west of Norway, and risen in our islands, where the wind had veered to south-west generally and fallen light. At the same time a southerly gale had set in on the eastern shores of the North Sea. In Ireland, though there had been scarcely any change of pressure in the night, the wind backed to south again, and increased to a strong breeze. Temperature rose considerably in Norway and the north-east of Great Britain, but did not change much in other places, and the weather remained very cloudy and foggy on our western and southern coasts, though it improved at the more northern stations.

From this date until the 7th the barometer fell continuously over France, and all but the northern parts of our islands; though in the United Kingdom the fall was at times interrupted by some oscillations, notably on the 4th and 5th, see Plate XIII. Temperature did not change much. Moderate to fresh south-easterly and southerly breezes prevailed during the period at almost all stations, but on our south-west coasts and in the extreme north they were stronger, exceeding 30 miles an hour daily at Falmouth, Valencia and Sandwick, and occasionally reaching the force of a gale at Valencia. On examining Plate XIII. we cannot fail to observe the regularity with which the wind freshened about the middle of the day and subsided again at night at Kew, Stonyhurst, and even at Aberdeen, though there the feature

is less distinct. Fine clear weather was general, but on the 4th a great deal of fog was reported in the east and south-east. At Rugby there was a thick fog till 10 a.m., 4th, followed by three days of very fine weather and brilliantly clear nights. Aurora was seen at Sandwick on the 6th, until which day pressure remained high over Russia and Germany, when it gave way.

March 7. The barometer had fallen about half an inch in the south of Ireland, and nearly 0·4 in. in the west of France since the previous morning. Readings varied from 30·1 ins. over Italy and the Adriatic, and 29·9 ins. in Denmark, to 29·5 ins. at Corunna, and 29·1 ins. at Valencia. A light S.E. wind blew over the greater part of Great Britain, France, and the North Sea, but was fresh at our south-western stations, with rather strong winds from the same quarter on our south-west coast. At the same time a S.S.W. gale had set in at Corunna, and an E.S.E. gale on the south coast of France. Clouds had become thick over France and rain set in on its western coast, as well as at Valencia, together with a marked increase of sea disturbance both there and at Scilly. In other places the weather was yet fine and generally bright, though somewhat hazy in some places. During the day, however, the barometer began to rise at the French stations, as well as over the Bay of Biscay and the south-west of our islands, where the change was rapid. Bright aurora was again seen at Sandwick and Thurso.

By the morning of the 8th the increase of pressure had become general on our coasts, (*see* curves in Plate XIV.,) though in the north and east readings were yet considerably lower than at 8 a.m. on the previous day. Over eastern Europe the barometer fell slowly. Temperature rose throughout Great Britain. The wind had veered to N.W. in the south of Ireland, and increased to a strong breeze at Valencia, while at our other stations it was still southerly, blowing freshly at certain places as the day advanced, and then veering westwards. The velocity of 30 miles an hour from the southward was exceeded at Falmouth, Holyhead, and Stonyhurst. Clouds increased on all our coasts, and some rain had fallen in the west and south. Lightning was seen at Scilly in the evening.

March 9. The barometer rose fast all day, but in Scotland the change was not steady. Temperature fell again, and the wind veered to W. or N.W. on all our coasts, but remained south-westerly in Holland, and fresh from S.E. at Skudesnaes. At Sandwick and Holyhead it rose to above 30 miles an hour at times, while at Moville a fresh gale had prevailed on the previous evening. On the whole, however, the winds were light. The weather, which was showery in the west and south on the 8th, became finer, and the sea, though rough in the south-west, was generally moderate or smooth.

During the next two days very little change occurred. On the 10th an anticyclone lay over central England and the English Channel, extending to Holland on the 11th, and as it did so our western pressures gave way slowly. Temperature rose;

the wind became southerly and fresh on all our coasts, the change being sudden in most places, while over central and southern France north-easterly and northerly winds prevailed. On the 11th the velocity rose to 46 miles from the southward at Valencia by 3 p.m., and exceeded 30 miles for 15 hours; while at Holyhead the wind blew freshly from 3 a.m., 11th, to 7 a.m. 12th, and rose to 43 miles from S. by E. at 3 a.m., 12th. Rain fell each day in the west and north, heavily on the 11th, and clouds were general, except in the south-east of our islands and over France. Aurora was seen in the extreme north on the 10th.

At 8 a.m. on the 12th readings were high (exceeding 30·3 ins.) over the Baltic and southern parts of Scandinavia, and almost equally high in Spain. Between these two regions lay a broad band of pressure exceeding 30·1 ins., over the north of France and English Channel. To the north of this district readings decreased to 29·6 ins. at Thurso, and to the south to 29·9 ins. at Toulon. The barometer had fallen slightly everywhere since the previous day, and continued to do so in England, chiefly in the south-east. Light south-westerly winds were prevalent in our islands, and variable breezes at the French stations. Temperature had risen throughout Great Britain, and was very uniform, being rather high in the north for the time of year. The weather was cloudy, and rainy in the west and north. A thunderstorm occurred at Carrickfergus at 5 p.m. Just before midnight a very brisk decrease of pressure set in at Valencia, and extended to all our other stations by 9 a.m. next day, accompanied by the backing of the wind to S.

March 13. The highest readings, which were somewhat lower than those reported on the 12th, were still over France and the eastern coasts of the North Sea, the lowest in the west and north-west of our islands. The barometer had fallen everywhere but in Caithness and at Christiansund; and since midnight the fall had become rapid in Ireland. In addition to this a very slight local depression was found over the south-eastern stations. Temperature fell several degrees both in the English Channel and the north of Scotland and Ireland, but very little change was shown elsewhere. During the day the wind rose to a very strong breeze from south on our western coasts, and freshened considerably in the north also. At Valencia a maximum velocity of 50 miles an hour was attained about the middle of the day, 47 miles at Holyhead by midnight, and force 8 (Beaufort scale) from S.S.E. was reported from Carrickfergus at 8 p.m. A good deal of rain fell in the west, little or none on our other coasts.

March 14. The depression whose approach was noticeable on the previous day now lay over Ireland, where readings had decreased half an inch in the 24 hours, and still more in the west of England. Its area was of considerable extent. Moderate to fresh southerly winds blew throughout Great Britain, with warmer weather, and south-easterly breezes on the eastern side of the North Sea; but in the south of

Ireland and at Scilly the wind had veered to W. and fallen light, with lower temperature. At about 3 a.m. a singular oscillation of pressure occurred at Falmouth, together with a temporary shift of the wind from S. by E. to S.W., and rain; again about 7.30 a.m. a similar shift occurred (the wind having previously returned to S. by E.), with rain, but hardly any oscillation was shown by the barometer. Later in the day pressure began to increase at all stations, and the disturbance disappeared. In Ireland and at Falmouth the wind veered to W. and N.; in Scotland it backed a little to the south-eastward, *but at Stonyhurst and Kew it backed to N.E. and N.N.E.;* so that it is difficult to conceive that the depression travelled over or from us, the appearances tending to the belief that it disappeared by being filled up.

March 15. Readings having increased from 0·3 to 0·4 in. in Ireland, and a little less in Scotland, were now very uniform in the west of Europe, but still high over Russia. During the night a slight but clearly marked depression had travelled eastwards over the northern parts of France, causing a temporary freshening of the wind both there and in the south of England. At 8 a.m. its centre was near Brussels, where a slight fall of the barometer was shown.

The wind, generally, was variable in our islands, though southerly and fresh on the north and west coasts. At Valencia the velocity exceeded 30 miles an hour from 2 to 3 p.m., and at Sandwick from 9 a.m. to 3 p.m. At Holyhead a similar force prevailed from 8 p.m. to midnight. In Denmark, Holland, and the south-east of England the wind was easterly, fresh from N.W. in the west of France, while at Biarritz a strong westerly gale was reported. Until late on the 16th the barometer continued to rise everywhere, especially in France, though in the afternoon of the 15th there was some interruption manifested at Valencia and Armagh. Temperature rose generally. The wind fell light at our own and the French stations, and rain fell except in the south-east. Thunder occurred at Scilly, and a bright display of aurora was seen at Thurso and Sandwick on the night of the 16th.

March 17. The increase of pressure had continued over France, but in eastern Europe the mercury was falling. In the night a slight diminution had taken place over Ireland also, and travelled rapidly towards Scotland. A considerable amount of wind and rain accompanied this disturbance on our west coasts, so that at Valencia a velocity of 44 miles was reached at 2 and 3 a.m., and 30 miles was attained subsequently at Armagh, Glasgow, Sandwick, Falmouth, and Holyhead. The whole effect was slight, however, except in the north, where it was preliminary to a more serious disturbance which took place next day.

March 18. The barometer, after a slight recovery from yesterday's diminution, had again fallen in Scotland, to the northward of which a small depression was observed at 8 a.m. (See Fig. 24, Pl. XVI.) Over Ireland pressure had increased

rather briskly. Gradients became rather steep for north-westerly winds, which set in generally on our coasts, and were strong in the north-west. At Carrickfergus there was a north-westerly gale all day, with very heavy squalls, subsiding towards midnight. From Denmark south-westerly winds were reported, and easterly winds in Norway. The depression now travelled rapidly to the south-eastward, and the wind veered towards N. on all our coasts. The following Table shows the principal features of the gale as registered anemometrically at the different observatories:—

| Observatories. March 18th, 1870. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Holyhead - | 3 a.m. (18th). | W. | 6 p.m. (18th). | W.N.W. | 48 | 10 | 10 a.m. (19th) | N. by W. | 31 | 9 p.m. (18th). | N.W. | 54 | |
| Stonyhurst - | 11 a.m. (18th). | W. | — | — | — | — | 7 p.m. (18th) | W.N.W. | 8 | 5 p.m. (18th). | W. by N. | 41* | * For 1 hour only. |
| Halifax - | 10 a.m. (18th). | W. by N. | — | — | — | — | 7 p.m. (18th) | N.W. by W. | 9 | 3 p.m. (18th). | N.W. by W. | 48* | |

The velocity of 30 miles was slightly exceeded at all the anemometer stations except Valencia, Kew, and Yarmouth, and at Alnwick Castle 41 miles was reached at 11 a.m., but here the force was very unsteady. Cloudy weather prevailed except in the S. and S.E. Snow and rain fell in Norway, the weather becoming colder, especially on the south-eastern coasts.

March 19. The recovery of pressure had been very rapid in the north of Scotland, and some increase had occurred at all our western stations. At 8 a.m. the centre of the storm was apparently a little to the north-eastward of Hamburg. Throughout western Europe gradients were for northerly winds, which prevailed generally, and were strong over the North Sea. Rain had fallen everywhere, with snow and hail in the E. of Great Britain, and the weather was very dull and cold. Aurora was seen at Sandwick in the evening.

March 20. At 8 o'clock the depression had apparently continued to advance south-eastwards and lay over Germany, while in our islands very little change of pressure was observed. Temperature, however, had again fallen generally, though the wind had moderated on all our own coasts. On the eastern shores of the North Sea strong northerly gales were blowing, with snow, and a very hard frost set in over Norway. The temperature at Oxö was 31° lower than that at Valencia. Snow fell again on our east coast. In addition to the large general disturbance above referred to, a fresh shallow depression showed itself off our south-west coasts, reducing pressure in that neighbourhood and drawing the wind into S. at Scilly. During the

day the depression became more marked and extensive, travelling eastward towards France. The weather remained showery and a good deal of snow fell in various parts of Great Britain. A bright auroral display was witnessed at Thurso in the evening, and a very thick white frost occurred in London.

March 21. The depression recently noticed over the north of Germany was still reported, while that which showed itself in the south-west yesterday lay over central France, where the barometer had fallen more than 0·3 in. In northern Europe the barometer stood high, and the weather was intensely cold. The northerly wind continued to blow hard at Oxö, while on our own coasts moderate N.E. breezes were general, drawing round to N. and N.W. in France. Temperature continued to fall generally and damp wintry weather prevailed.

March 22. The barometer continued to rise fast in northern Europe, readings in Finland exceeding 30·7 ins. At Haparanda, Gulf of Bothnia, temperature fell to −10·5° F. The two depressions mentioned yesterday became merged into one large disturbance, which was apparently lying over the east of France and west of Germany. In these islands the barometer rose. A further fall of temperature occurred on our south and west coasts as well as over France. The N.E. wind increased in strength at our eastern stations, and heavy snow fell in France and most parts of Great Britain.

For the next four days the changes in and around our islands were very gradual and regular. Over northern Europe the high pressure gave way considerably, while the French depression travelled very slowly to the westwards till the 24th, when it extended over the whole of France, the English Channel, and the most southern parts of England. After this it dispersed. Thus, readings showed gradually decreasing pressure throughout our islands. Easterly winds continued, with cold weather, and frequent heavy showers of snow and hail. A thunderstorm occurred at Yarmouth on the 22nd; aurora was seen at Rugby on the 23rd, and lightning at Dublin on the 24th. Even at Dublin sleet or snow fell every day from the 21st to the 27th. The nights were generally clear in England, especially in the S. and S.E., severe ground frosts occurring in many places. On the 25th and 26th pressure gave way rather faster in the north than elsewhere, and readings in northern Europe were consequently considerably reduced.

March 27. The barometer had risen fast over central Europe. The region of highest pressure (which rather exceeded 29·9 ins.) now lay over the Mediterranean, Switzerland and central Germany, while the lowest readings were found over the south of Ireland and to the northward of Scotland. At 8 a.m. there were apparently two depressions in our neighbourhood; one near Valencia, giving us southerly winds in England, of considerable strength on our western coasts; the other, to the westward of Norway, producing moderate north-westerly and westerly winds in Scotland. (See Fig. 26, Plate XVIII.) Temperature rose fast everywhere, the change shown at Kew and Stonyhurst being very large. At Kew the thermometer rose 25° between

about 5 a.m. and 3 p.m., which, for the time of year, and with an overcast sky, is remarkable, and as will be seen from the table on p. 38 the five-day mean for March 27–31 is 13° 8 higher than that for the five preceding days. As the day proceeded both depressions advanced towards the land, and their influence extended considerably. The steepest gradients soon passed over our southern and the French stations, accompanied by a fresh southerly gale in several places. Rain fell except on our S.W. coasts. At Valencia the velocity rose to 37 miles from E. at 5 a.m.; at Falmouth 45 miles from S. by E. was attained at 5 p.m., when the wind veered to S.S.W.; Holyhead had S., 33 miles at 4 p.m.; Kew S., 36 miles at 10 p.m.; and Yarmouth, S. by E., 37 miles, at midnight. In the north we find Sandwick with 41 miles from N.W. by N. at 5 a.m.

March 28. The centre of the south-western depression lay over the south coast of Ireland, while the more northern one was between Scotland and Norway. (See Fig. 27, Pl. XVIII.) Some recovery of pressure had occurred at Valencia in the night, and the wind had shifted to E., but the barometer had already recommenced falling. Gradients were now steepest in the north of France. Strong south-westerly winds still blew at the southern stations—the remnant of the southerly gale which had been blowing in the Channel and S. of England all night,—and in Holland similar winds were reported. At Kew, the wind continued strong from S.S.W. all day, the maximum velocity being 37 miles at 1 p.m. Fresh south-easterly breezes prevailed in Norway; and light northerly airs in Scotland, with fine cold weather. At Nairn the thermometer stood 30° lower than it did at Scilly. With these conditions the changes of temperature at stations lying between the two depressions were necessarily sudden and frequent, as is shown by the Armagh and Stonyhurst curves about this time, but in the south-east, however, the warm weather lasted till the close of the month, as shown by the Kew thermogram. The southerly current was the more powerful of the two, and gradually gained ground; the south-western depression underwent some modifications and travelled northwards, while a new and more extensive one advanced on our western coasts. Rain fell everywhere during the day, most heavily in the south, and a bright aurora was seen at Thurso in the evening. The maximum velocities, recorded from the new disturbance were, for Valencia, 44 miles, from S. at 10 p.m.; Falmouth, 45 miles, from S.W. by S., at 6 p.m.; Holyhead, 37 miles, from S.S.W., at 11 p.m.; and Halifax, 32 miles, from S.W. by S., at 9 p.m. At Holyhead a temporary shift to E. occurred before the new disturbance was felt similar to that previously shown at Valencia.

March 29. At 8 a.m. the region of highest barometrical readings lay over the Adriatic, Italy, and the eastern parts of the Mediterranean. Over north-western Europe the distribution of pressure was very complicated. The more northern depression of the past few days had travelled eastwards over Norway, and its influence on the wind at the Scotch stations was barely traceable. The slight disturbance which was

yesterday morning over our south-west coasts now lay over the north-west of Great Britain and the Irish Sea, while the new disturbance had advanced over the west of Ireland. (See Fig. 28, Plate XVIII.) Gradients were steepest over France, the English Channel, and the south of England, where fresh to strong S. and S.W. winds still prevailed. At Falmouth the velocity exceeded 30 miles from 10 a.m. to 7 p.m., the maximum being 38 miles from S. by W. at noon; while at Holyhead the wind increased after 5 p.m., and reached 43 miles from S. at midnight. Temperature rose several degrees, except in the south of England and north-west of France, the rise which occurred at Armagh between 6 and 11 a.m. being very sudden and considerable. (See Plate XVIII.) Rain fell everywhere, most in the English and St. George's Channel and the south of England, and still continued on the south-west coasts. The sky was overcast everywhere, and at night bright aurora was again seen in the north of Scotland.

March 30. The Norwegian depression had entirely disappeared, and the barometer had consequently risen in the north. The slight disturbance on our north-west coasts showed very little change beyond extending itself in an easterly direction, while that off the west coast of Ireland seemed to be breaking up, as pressure gave way briskly over France, while it rose in Ireland. Temperature fell at the Irish stations, and in some parts of England. Easterly winds were general in Norway, Scotland, and the north of England, but southerly and south-westerly breezes prevailed everywhere else. Dull cloudy weather continued, with rain in the east of Great Britain. During the day the barometrical recovery extended to all our coasts, and, being much more rapid in the south-west and north than elsewhere, a shallow depression formed in the west of our islands. Aurora was seen both in London and the north of Scotland at night, and thunder and lightning occurred at Liverpool in the afternoon.

March 31. The area of lowest pressure (apparently only a modification of that noticed on our north-western coasts yesterday) now lay over the greater part of Ireland and St. George's Channel, while a second and very extensive, but shallow depression was found over Denmark and Scandinavia. The north-easterly wind extended over all the northern parts of the United Kingdom, while the southerly wind veered towards W. at the southern stations, and both currents freshened. At Sandwick the N.E. wind exceeded a velocity of 30 miles from 10 a.m. to 2 p.m., and reached 30 miles at Holyhead at 8 a.m., continuing fresh all day, while the westerly current rose to 33 miles at Falmouth by 11 a.m., and was also fresh all day. In the west of France a moderate westerly gale set in, gradients being much steeper there than elsewhere. The weather became colder everywhere but in Ireland. Rain had again fallen generally, and, though the sky cleared in Norway, elsewhere it was still overcast and unsettled.

## Remarks.

The following table gives the number of hours in which the velocity of the wind was 30 miles an hour or more (irrespective of direction) during each month and the entire quarter, for each of the observatories and anemometer stations. It will be observed that the records of a new anemometer at Moorside, Halifax, are added to those hitherto given. The instrument is the property of L. J. Crossley, Esq., and is precisely similar to those in use at the observatories of the Meteorological Committee.

| Observatory. | Jan. | Feb. | March. | Total. | Observatory. | Jan. | Feb. | March. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| Valencia - - | 249 | 243 | 174* | 666 | Holyhead - | 324 | 189 | 224 | 737 |
| Armagh - - | 43 | 15 | 5 | 63 | Stonyhurst - | 74 | 17 | 8 | 99 |
| Glasgow - - | 50 | 15† | 7 | 72 | Halifax(Moorside) | 49 | 3 | 11 | 63 |
| Aberdeen - - | 50 | 104 | 21 | 175 | Alnwick Castle - | 79 | 13 | 7 | 99 |
| Sandwick - - | 149‡ | 212 | 114 | 475 | Kew - - - | 47 | 0 | 11 | 58 |
| Falmouth - - | 176 | 155 | 101 | 432 | Yarmouth - - | 60 | 34 | 25 | 119 |

* Clock stopped from 11 a.m. 19th to 10 a.m. 20th; wind probably light all the time.
† No trace from 5 p.m. to 11 p.m. 23rd, nor from 2 a.m. to 4 a.m. 24th; wind light.
‡ Clock stopped from 7 a.m. to 10 a.m. 22nd; wind light.

Holyhead and Valencia again stand out with the largest number of hours, while Kew has the smallest. In January the values are larger at all the Irish and Scotch observatories than they were in 1870 and 1871, but not quite so high as those in 1869, while at Falmouth, Stonyhurst, and Kew they exceed those of any of the three previous years, and at Holyhead they are more than in 1870 and 1871. At Yarmouth, however, there is a singular anomaly, the number being the smallest hitherto registered in January. In the months of February and March the numbers vary so much in the different years that it is impossible to make any verbal comparison between them without confusing the reader.

*Pressure.*—The following tables give the mean and extreme readings in each month, as in the reports for the previous years.

January.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | D. H. | Inches. | D. H. | Inches. |
| Valencia - - | 29·421 | −0·333 | 30·083 | 14th, 11 a.m. | 28·345 | 24th, 2 p.m. | 1·738 |
| Armagh - - | 29·397 | −0·378 | 30·016 | 12th, 3 a.m.<br>27th, 10 a.m. | 28·271 | 18th, 1 a.m. | 1·745 |
| Glasgow - - | 29·377 | −0·359 | 29·994 | 10th, 4 a.m. | 28·291§ | 18th, 1 a.m. | 1·703 ? |
| Aberdeen - - | 29·366 | −0·357 | 30·019 | 28th, 10 a.m. | 28·169 | 18th, 8 a.m. | 1·850 |
| Falmouth - - | 29·592 | −0·380 | 30·165 | 12th, 5 a.m. | 28·419 | 23rd, midngt. | 1·746 |
| Stonyhurst - - | 29·492 | −0·321 | 30·094 | 11th, 11 a.m. | 28·431 | 24th, 8 a.m. | 1·663 |
| Kew - - - | 29·638 | −0·300 | 30·204 | 12th, 11 a.m. | 28·346 | 24th, 5 a.m. | 1·858 |

§ Doubtful, curve indistinct from 1-9 a.m. The minimum reading was probably lower.

Pressure was much below the average everywhere, especially at Falmouth and Armagh. The absolute maximum reading is found at Kew, while the lowest was at Aberdeen. The minimum pressure occurred at all the northern observatories on the 18th; elsewhere it was recorded at some time on the 24th. In all places the mean was very much lower than in either of the three preceding years, but the range was not excessive for the month.

February.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | D. H. | Inches. | D. H. | Inches. |
| Valencia - - | 29·554 | −0·341 | 30·119 | 27th, 8 a.m. | 28·967 | 1st, 4 a.m. | 1·152 |
| Armagh - - | 29·624 | −0·233 | 30·247 | 27th, 10 a.m. | 29·041 | 1st, 7 a.m. | 1·206 |
| Glasgow - - | 29·667 | −0·177 | 30·221 | 27th, 9 a.m. | 29·106 | 2nd, 2 a.m. | 1·115 |
| Aberdeen - - | 29·711 | −0·144 | 30·174 | 27th, 11 a.m. | 29·133 | 1st, 9 a.m. | 1·041 |
| Falmouth - - | 29·746 | −0·290 | 30·220 | 27th, noon | 29·271 | 1st, 8 p.m. | 0·949 |
| Stonyhurst - | 29·734 | −0·169 | 30·235 | 27th, 11 a.m. | 29·281 | 2nd, 2 a.m. | 0·954 |
| Kew - - - | 29·862 | −0·146 | 30·245 | 27th, 10 p.m. | 29·499 | 26th, 6 a.m. | 0·746 |

At all the observatories pressure was still considerably lower than the average, and, with the exception of Aberdeen, lower than in either of the three preceding years. At that station, however, the mean for the month of February, 1869, was nearly 0·06 in. lower than that just quoted. The highest readings occurred on the 27th throughout the country, while the lowest (except at Kew) were recorded during the 1st or 2nd. The range was small everywhere, especially at Kew, *much* smaller than in the years 1869–71.

March.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | D. H. | Inches. | D. H. | Inches. |
| Valencia - - | 29·683 | −0·191 | 30·215 | 19th, 1 a.m. | 28·905 | 28th, 3 p.m. | 1·310 |
| Armagh - - | 29·715 | −0·056 | 30.238 | 10th, 9 a.m. | 29·045 | 28th, 7 p.m. | 1·193 |
| Glasgow - - | 29·717 | +0·001 | 30·256 | 10th, 9 a.m. | 29·099 | 28th, 9 p.m. | 1·157 |
| Aberdeen - | 29·727 | +0·011 | 30·254 | 10th, 8 a.m. | 29·139 | 28th, 11 p.m. | 1·115 |
| Falmouth - | 29·786 | −0·103 | 30·351 | 10th, noon. | 29·293 | 30th, 3 p.m. | 1·058 |
| Stonyhurst - | 29·756 | −0·088 | 30·316 | 10th, 10 a.m. | 29·026 | 28th, 3 a.m. | 1·290 |
| Kew - - | 29·811 | −0·017 | 30·356 | 10th, 9 a.m. | 29·272 | 30th, 3 p.m. | 1·084 |

With the exception of the Scotch stations the mean pressure was still slightly below the average, and at the western and northern observatories it was much lower than in the preceding three years. The maximum reading was registered on the 10th everywhere but at Valencia, where the high reading on that day was slightly exceeded by

one shortly after midnight of the 18th. The minimum was recorded on the 28th at most places, but on the 30th in the south of England. Only at Valencia did the mercury sink below 29 ins. during the month. The range was small generally.

*Temperature.*— January.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | D. H. | ° | D. H. | ° |
| Valencia - - | 45·7 | +2·7 | 53·6 | 12th, 11 a.m. | 34·7 | 20th, 9 a.m.<br>21st, 6 a.m. | 18·9 |
| Armagh - - | 40·5 | +0·9 | 52·5 | 29th, 4 p.m.<br>31st, 2 p.m. | 26·0 | 21st, 9 a.m. | 26·5 |
| Glasgow - - | 40·6 | +3·3 | 52·2 | 31st, 4 p.m. | 29·4 | 10th, 2 a.m. | 22·8 |
| Aberdeen - - | 40·0 | +3·9 | 49·9 | 30th, 2 p.m. | 30·3 | 10th, 5 a.m.<br>28th, 9 a.m. | 19·6 |
| Falmouth - - | 46·0 | — | 53·2 | 4th, 10 p.m. | 37·0 | 20th, 4 a.m. | 16·2 |
| Stonyhurst - - | 40·6 | +3·2 | 53·9 | 30th, 2 p.m. | 29·2 | 10th, 4 a.m. | 24·7 |
| Kew - - - | 41·9 | +5·3 | 52·6 | 5th, 4 a.m. | 26·0 | 15th, 9 a.m. | 26·6 |

Temperature was above the average generally, though the excess is less marked at Armagh than elsewhere, but at no place was it so high as in 1869. The maximum occurred in the south of England in the night of the 4th–5th, at Valencia on the 12th, but in the northern parts of Great Britain and Ireland on the 30th or 31st; while the minimum was registered on the 10th in the north-west of Great Britain, on the 15th at Kew, on the 20th or 21st at the Irish observatories and Falmouth, and on the 28th at Aberdeen. The minimum was not a low one for the time of year.

February.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | D. H. | ° | D. H. | ° |
| Valencia - - | 47·3 | +3·2 | 53·3 | 28th, 1 p.m. | 38·8 | 3rd, 9 p.m. | 14·5 |
| Armagh - - | 43·9 | +3·2 | 52·7 | 24th, 4 p.m. | 32·0 | 27th, 7 a.m. | 20·7 |
| Glasgow - - | 42·0 | +3·9 | 50·0 | 13th, 2 p.m. | 30·0 | 8th, 7 a.m.<br>27th, 7 a.m. | 20·0 |
| Aberdeen - - | 41·2 | +4·0 | 53·5 | 29th, 2 p.m. | 31·3 | 8th, 9 a.m.<br>24th, 3 a.m. | 22·2 |
| Falmouth - - | 47·6 | — | 55·5 | 29th, 1 p.m. | 40·4 | 21st, 8 a.m. | 15·1 |
| Stonyhurst - - | 43·3 | +4·8 | 52·8 | 10th, 2 p.m. | 36·3 | 16th, 10 p.m. | 16·5 |
| Kew - - - | 45·1 | +6·5 | 56·0 | 10th, 2 p.m. | 32·3 | 22nd, 2 a.m. | 23·7 |

The weather continued warm through February, especially in the south-east of England. The various maxima occurred at very different times of the month, the highest of all being registered at Kew on the 10th. The minimum reading was only two degrees below the freezing point of water, and was registered at Glasgow on both the 8th and 27th. The range was nearly as great at the northern observatories as at Kew, but was small everywhere as compared with that in the three previous Februaries.

## March.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | D. H. | ° | D. H. | ° |
| Valencia - - | 47·0 | +1·6 | 55·7 | 16th, 2 p.m. | 31·4 | 26th, 4 a.m. | 24·3 |
| Armagh - - | 43·6 | +2·0 | 58·4 | 4th, 2 p.m. | 26·9 | 26th, 7 a.m. | 31·5 |
| Glasgow - - | 42·1 | +2·5 | 58·6 | 7th, 2 p.m. | 25·5 | 26th, 6 a.m. | 33·1 |
| Aberdeen - - | 41·0 | +2·2 | 55·2 | 16th, 2 p.m. | 29·0 | 21st, 8 a.m. | 26·2 |
| Falmouth - - | 47·0 | — | 57·1 | 16th, 2 p.m. | 32·7 | 23rd, 6 a.m. | 24·4 |
| Stonyhurst - - | 43·4 | +3·8 | 58·6 | 6th, 3 p.m. | 22·1 | 26th, 5 a.m. | 36·5 |
| Kew - - - | 44·8 | +3·4 | 59·7 | 7th, 1 p.m. | 27·4 | 26th, 5 a.m. | 32·3 |

In March we find that the temperature was again above the average at all our observatories. At Valencia, Falmouth, and Aberdeen the maximum took place on the 16th, but elsewhere it occurred earlier in the month; while the minimum (which was in all cases considerably lower than that recorded in February) took place on the 26th, except at Aberdeen and Falmouth. The range was larger than in either January or February, and was greatest at Stonyhurst, where also the lowest temperature was recorded.

The next table shows the variations from the averages of the five-day mean temperatures at Kew during the entire quarter.

| Date. | Variation. | Date. | Variation. | Date. | Variation. |
|---|---|---|---|---|---|
| | ° | | ° | | ° |
| Jan. 1–5 - | + 7·2 | Jan. 31–Feb. 4 | + 3·4 | March 2–6 - | + 9·0 |
| „ 6–10 - | + 2·9 | Feb. 5–9 - | + 7·9 | „ 7–11 - | + 4·2 |
| „ 11–15 - | + 4·0 | „ 10–14 - | + 8·0 | „ 12–16 - | + 5·6 |
| „ 16–20 - | + 4·2 | „ 15–19 - | + 5·4 | „ 17–21 - | − 0·1 |
| „ 21–25 - | + 1·7 | „ 20–24 - | + 5·8 | „ 22–26 - | − 5·8 |
| „ 26–30 - | + 1·1 | „ 25–March 1 | + 5·6 | „ 27–31 - | + 8·0 |

From this table it is evident that, with the exception of ten days near the end of March, the weather at Kew was continuously warm for the time of year. We find exceptionally warm periods in the first five days of January, between the 5th and 14th of February, from the 2nd to the 6th March, and again between the 27th and 31st. The change from the mean temperature of March 22–26 to that of March 27–31 is *very* sudden, the values for the two periods differing from one another by nearly 14°.

## RAIN.

The following table is drawn up from returns precisely similar to those employed for the first quarter of 1871.

# RAINFALL, 1872.

| Positions of Gauges. | | | January. | | | | | | | February. | | | | | | | March. | | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Names of Stations. | Height of Gauge. Above Ground. | Above Mean Sea Level. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | |
| **Observatories.** | | | | | | | | | | | | | | | | | | | | | | | | |
| | ft. in. | ft. | | in. | in. | in. | | | | | in. | in. | in. | | | | | in. | in. | in. | | | | |
| Valencia | 2 0 | 11 | 28 | 8·51 | +1·46 | 0·82 | 31st | 0 | – | 26 | 7·14 | +3·32 | 0·96 | 4th | 0 | – | 23 | 4·26 | −0·64 | 0·73 | 10th | 0 | – | |
| Armagh | 2 2 | 204 | 23 | 4·54 | +1·81 | 0·91 | 30th | 0 | – | 17 | 2·74 | +0·82 | 0·50 | 11th | 0 | – | 18 | 2·92 | +0·71 | 0·68 | 31st | 0 | – | |
| Glasgow | 1 10 | 180 | 24 | 4·94 | −0·13 | 0·70 | 31st | 0 | – | 19 | 2·56 | −1·36 | 0·90 | 24th | 0 | – | 19 | 2·32 | −1·05 | 0·63 | 29th | 0 | – | |
| Aberdeen | 2 0 | 48 | 15 | 2·33 | −0·51 | 0·28 | 24th & 25th. | 0 | – | 19 | 4·24 | +1·91 | 0·64 | 25th | 0 | – | 22 | 2·29 | +0·32 | 0·57 | 29th | 0 | – | |
| Falmouth | 1 10 | 167 | 25 | 7·78 | +3·37 | 0·77 | 10th | 0 | – | 25 | 8·52 | +5·01 | 1·16 | 22nd | 1 | 22nd | 24 | 4·34 | +1·48 | 1·27 | 27th | 1 | 27th | |
| Stonyhurst | 1 9 | 377 | 28 | 5·47 | +1·48 | 0·59 | 23rd | 0 | – | 25 | 5·02 | +1·13 | 1·83 | 29th | 1 | 29th | 25 | 4·32 | +1·40 | 0·90 | 28th | 0 | – | |
| Kew | 1 10 | 20 | 19 | 3·03 | +1·05 | 0·49 | 23rd | 0 | – | 16 | 0·81 | −0·54 | 0·20 | 22nd | 0 | – | 11 | 1·26 | −0·43 | 0·24 | 17th | 0 | – | |
| **Telegraphic Reporting Stations.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Shetland (Sumburgh Head) | 1 9 | 170 | 26 | 5·68 | +2·47 | 0·65 | 13th | 0 | – | 17 | 4·82 | +2·61 | 1·18 | 4th | 1 | 4th | 16 | 2·58 | +1·12 | 0·65 | 11th | 0 | – | |
| Thurso | 1 9 | 25 | 26 | 3·73 | +1·36 | 0·63 | 13th | 0 | – | 20 | 1·57 | −1·91 | 0·50 | 16th | 0 | – | 21 | 1·74 | −0·59 | 0·49 | 17th | 0 | – | |
| Wick | 1 9 | 100 | 20 | 3·27 | +1·60 | 0·60 | 13th | 0 | – | 15 | 1·82 | −0·34 | 0·50 | 16th | 0 | – | 14 | 1·97 | +0·05 | 0·56 | 26th | 0 | – | |
| Nairn | 1 2 | 44 | 16 | 2·37 | −0·39 | 1·01 | 13th | 1 | 13th | 10 | 0·66 | −1·33 | 0·14 | 29th | 0 | – | 18 | 1·20 | −0·01 | 0·23 | 21st | 0 | – | |
| ~~Aberdeen~~ | ~~1 2~~ | ~~59~~ | ~~17~~ | ~~2·09~~ | ~~−0·69~~ | ~~0·31~~ | ~~13th~~ | ~~0~~ | ~~–~~ | ~~17~~ | ~~4·27~~ | ~~+2·35~~ | ~~0·82~~ | ~~25th~~ | ~~0~~ | ~~–~~ | ~~21~~ | ~~1·93~~ | ~~+0·14~~ | ~~0·59~~ | ~~29th~~ | ~~0~~ | ~~–~~ | |
| Leith | 1 2 | 21 | 17 | 3·03 | +0·93 | 0·55 | 5th | 0 | – | 13 | 1·56 | −0·29 | 0·55 | 24th | 0 | – | 16 | 2·47 | +1·47 | 0·74 | 29th | 0 | – | |
| North Shields | 10 0 | 107 | 22 | 2·32 | +0·28 | 0·41 | 24th | 0 | – | 22 | 2·07 | +0·53 | 0·77 | 24th | 0 | – | 19 | 2·50 | +0·66 | 0·41 | 20th | 0 | – | |
| Scarborough | 1 0 | 130 | 18 | 2·80 | +0·46 | 0·40 | 23rd | 0 | – | 21 | 2·00 | +0·61 | 0·36 | 5th | 0 | – | 17 | 2·91 | +1·10 | 0·59 | 21st | 0 | – | |
| Yarmouth | 5 2 | 24 | 17 | 4·89 | +1·55 | 0·92 | 13th | 0 | – | 12 | 1·49 | −1·06 | 0·48 | 7th | 0 | – | 12 | 3·29 | +1·05 | 0·73 | 29th | 0 | – | |
| Ardrossan | 1 2 | 13 | 24 | 7·50 | +2·35 | 0·94 | 10th | 0 | – | 21 | 3·41 | −0·59 | 0·98 | 24th | 0 | – | 16 | 4·11 | +2·09 | 1·06 | 11th | 1 | 11th | |
| Greencastle | 7 6 | 70 | 25 | 6·66 | +2·70 | 0·74 | 13th | 0 | – | 21 | 2·64 | −1·00 | 0·44 | 16th | 0 | – | 18 | 3·38 | +0·78 | 0·64 | 30th | 0 | – | |
| Holyhead | 1 2 | 44 | 16 | 6·07 | +1·93 | 1·30 | 1st | 1 | 1st | 10 | 2·99 | +0·36 | 0·48 | 1st | 0 | – | 14 | 3·56 | +1·38 | 0·54 | 11th | 0 | – | |
| Liverpool (Bidston Observatory) | 0 6 | 180 | 23 | 3·45 | +1·52 | 0·43 | 4th | 0 | – | 19 | 2·20 | +0·63 | 0·46 | 29th | 0 | – | 15 | 2·13 | +0·74 | 0·62 | 27th | 0 | – | |
| Roche's Point | 1 9 | 23 | 27 | 7·81 | +0·67 | 0·78 | 12th | 0 | – | 22 | 4·65 | +0·78 | 0·39 | 9th | 0 | – | 17 | 4·63 | +0·32 | 0·82 | 11th | 0 | – | |
| Pembroke | 1 2 | 125 | 27 | 5·40 | −0·51 | 0·74 | 1st | 0 | – | 23 | 5·62 | +2·05 | 0·74 | 10th | 0 | – | 25 | 3·98 | +0·31 | 0·75 | 27th | 0 | – | |
| Scilly | 1 9 | 100 | 26 | 6·70 | — | 0·97 | 4th | 0 | – | 24 | 5·17 | — | 0·60 | 22nd | 0 | – | 22 | 4·07 | — | 0·66 | 13th | 0 | – | |
| Plymouth | 27 0 | 95 | 27 | 6·31 | +0·99 | 0·71 | 23rd | 0 | – | 23 | 5·89 | +2·24 | 0·62 | 22nd | 0 | – | 15 | 3·51 | +0·03 | 0·88 | 27th | 0 | – | |
| Portsmouth | 1 0 | 16 | 21 | 4·79 | +1·18 | 0·79 | 23rd | 0 | – | 17 | 1·65 | −0·73 | 0·18 | 7th | 0 | – | 14 | 2·32 | +0·49 | 0·52 | 29th | 0 | – | |
| Dover | 23 0 | 46 | 20 | 4·10 | — | 0·50 | 7th | 0 | – | 17 | 1·75 | — | 0·25 | 7th, 17th, & 26th | 0 | – | 17 | 1·69 | — | 0·44 | 30th | 0 | – | |
| London | 1 3 | — | 22 | 3·38 | +0·59 | 0·50 | 23rd | 0 | – | 18 | 1·17 | −0·73 | 0·37 | 22nd | 0 | – | 15 | 2·20 | +0·41 | 0·42 | 28th | 0 | – | |
| **Extra Stations.** (Information supplied by Societies, private individuals, and others.) | | | | | | | | | | | | | | | | | | | | | | | | |
| Barnstaple | 0 8 | 31 | 27 | 6·59 | +2·22 | 0·77 | 23rd | 0 | – | 24 | 4·64 | +1·88 | 0·84 | 22nd | 0 | – | 21 | 3·93 | +1·36 | 0·78 | 27th | 0 | – | |
| Dublin | 3 0 | 57 | 23 | 2·86 | +0·13 | 0·50 | 3rd | 0 | – | 20 | 2·56 | +0·88 | 0·43 | 4th | 0 | – | 21 | 2·42 | +0·62 | 0·48 | 27th | 0 | – | |
| Florence Court (co. Fermanagh) | 13 0 | 300 | 28 | 9·17 | +4·19 | 1·95 | 31st | 1 | 31st | 25 | 4·38 | +1·11 | 1·07 | 23rd | 1 | 23rd | 18 | 3·62 | −0·13 | 0·71 | 11th | 0 | – | |
| Galway | 8 2 | 30 | 29 | 6·63 | +0·30 | 0·92 | 31st | 0 | – | 21 | 3·93 | −0·58 | 0·48 | 15th | 0 | – | 20 | 2·72 | −0·82 | 0·47 | 28th | 0 | – | |
| Guernsey | 12 0 | 204 | 24 | 6·17 | +1·45 | 0·79 | 17th | 0 | – | 18 | 3·30 | +0·70 | 0·70 | 22nd | 0 | – | 17 | 4·23 | +0·54 | 1·06 | 28th | 1 | 28th | |
| Helston | 5 0 | 115 | 27 | 7·30 | +3·03 | 0·80 | 10th | 0 | – | 27 | 6·13 | +3·29 | 0·92 | 22nd | 0 | – | 18 | 3·69 | +0·68 | 0·85 | 27th | 0 | – | |
| Jersey | 36 11 | 39 | 25 | 4·38 | +0·96 | 0·57 | 23rd | 0 | – | 14 | 1·49 | −0·59 | 0·36 | 29th | 0 | – | 18 | 1·95 | −1·38 | 0·28 | 28th | 0 | – | |
| Rugby | 3 0 | 383 | 29 | 3·91 | +1·82 | 0·67 | 23rd | 0 | – | 23 | 2·20 | +0·79 | 0·79 | 17th | 0 | – | 10 | 1·64 | −0·31 | 0·50 | 31st | 0 | – | |
| Sandwick, Orkney Islands | 2 0 | 78 | 28 | 4·35 | +0·43 | 0·74 | 12th | 0 | – | 22 | 2·14 | −1·76 | 0·47 | 16th | 0 | – | 18 | 2·05 | −0·97 | 0·67 | 10th | 0 | – | |

The months of January and March were very wet generally, and so was February also, but not so universally.

## PART 2.

April 1. The barometer had risen rather briskly over the eastern parts of the United Kingdom and the North Sea, while a slight depression had shown itself in St. George's Channel during the night. The winds were light generally, varying in direction, from south-westerly in the west of France, to south-easterly in the north of our islands, the weather being cloudy and wet. Between the 1st and 3rd the disturbance travelled eastwards to the north of Germany, and was succeeded by a general and brisk rise of the barometer, strong N.W. winds, and a fall of temperature. Figs. 29 and 30, Plate XIX., show the position of the disturbance at 8 a.m. 2nd, and at 8 a.m. 3rd —while it was passing entirely out of our area (*see* Fig. 30)—a second depression had formed between the coasts of Norway and Scotland, and the rather sudden fall of the barometer at Valencia and Falmouth in the night of 2nd–3rd, together with a shift of wind to the Eastward, point to a third system of circulation established a little to the westward of the mouth of the English Channel. By 8 a.m., 4th, the more northern of these new disturbances lay apparently near the south-western coast of Denmark (Fig. 31), but the southern one had disappeared. At Holyhead the velocity even exceeded 40 miles an hour from 9 p.m. 3rd, to 3 p.m. 4th, and at Southport 705 miles of air passed between 9 a.m. 3rd, and 9 a.m. 4th. At our western stations the weather, which had been showery everywhere, with a little snow in some places, now improved considerably. Slight aurora was seen at Sandwick and Pembroke on the 3rd.

April 5. A rapid increase of pressure had taken place over the North Sea and Scotland (*see* Aberdeen barogram, Plate XIX.), and at 8 a.m. the western portion of an anticyclone, with readings exceeding 30·4 ins., stretched from the south of Norway, across the North Sea, to Leith. In consequence of this the wind veered to N.E. at the southern stations, while in the north-west and north it drew round to S. and S.W., and was light generally. Very little change occurred during the day, except that readings continued to increase steadily, so that at Oxö pressure exceeded 30·6 in. By 8 a.m. 6th the weather was fine but hazy, with a few showers in the W. and N. During the 6th and 7th, however, temperature rose in our islands, and the Scandinavian pressures gave way. At 8 a.m., 7th, a band of high pressure stretched from N.E. to S.W., across the North Sea, south of England, and north of France, while readings exceeded 30·5 ins. over the mouth of the Channel and north-west of France. The weather was fine as yet, but the south-westerly wind to the northward of the zone of high pressure freshened considerably at our western stations in the afternoon and evening. In the early morning of the 8th a depression advanced from the north-westward between the Scotch coast and Norway, considerably reducing the pressure at the neighbouring stations. *See* Fig. 32, and the northern barograms, Plate XX. The wind, as the centre travelled south-eastwards, veered into N.W.,

increasing to a fresh or strong breeze generally, and to a fresh N.W. gale on several parts of our north and north-east coasts. The anemometers at Sandwick, Aberdeen, and Alnwick Castle all registered velocities exceeding 40 miles an hour for a few hours. Some rain fell in most places.

At 8 a.m., 9th, the centre of the disturbance had crossed the North Sea and lay over the Baltic. Fresh northerly breezes and cloudy weather prevailed on the coasts of Great Britain, with a rising barometer; northerly gales at the Dutch stations and the mouth of the Elbe (Fig. 33); while in Ireland (to the westward of a region of high pressure lying over the entrance of the Bristol Channel) light S.S.W. winds had set in. After about noon a new but gradual decrease of pressure commenced in the north and west, but passed off again to the north-eastward, causing no great change of weather.

At 8 a.m. on the 10th the maximum pressure (rather above 30·2 in.) was over western central France, while the lowest readings were on our north-west coasts. The recent northerly winds had given way to light south-westerly breezes in the British Islands, with easterly winds in the west of France. The weather was fine generally, with fog in the south-east. During the day the wind became fresh from S.W. in the W. and N., and brilliant auroral streamers were seen at most places in the evening. The barometer now fell very slowly in all places till the 12th, when a brisk recovery set in, commencing at the south-western stations, but being accompanied by a continued fall of the mercury in Scandinavia. Thunder was heard at Aberdeen on the evening of the 12th.

At 8 a.m., 13th, pressure had increased about half an inch in the south of Ireland since the previous morning. The eastern portion of an anticyclone lay over our south-western stations, while a depression, whose lowest readings were rather below 29·5 ins., had formed in Norway. This depression travelled eastwards, and by 8 a.m., 15th, its centre was near St. Petersburg. In consequence of this movement a recovery of pressure took place in Norway, and in our islands the barometer continued to rise slowly. Moderate to fresh W. and N.W. winds blew on the coasts of the North Sea, and at Sandwick a very fresh westerly breeze was recorded during the 14th. In the more western parts of the kingdom light variable breezes were prevalent. Temperature changed little, beyond the ordinary diurnal range, which, as the weather continued very fine, was large at all the observatories.

On April 15th a slight concavity is shown in the barograms of the northern observatories, accompanied by an increase of westerly wind, cloudy weather, and a slight fall of temperature. In most of these places the velocity rose to little above 30 miles an hour, but at Sandwick it increased to a strong breeze, exceeding 40 miles after 6 p.m., and continuing for some days, as will be seen further on. Aurora was seen at all the western and northern stations in the evening. On the 16th a considerable decrease of pressure had taken place over the eastern coasts of the North Sea, while our own barometers fell but slowly. The wind increased materially from the north-westward on all the northern coasts, attaining a velocity of 63 miles at Sandwick by 10 a.m., and

frequently blowing 49 miles at Aberdeen between 11 a.m. and 7 p.m. Glasgow recorded a maximum of only 37 miles at 2 p.m., but Holyhead had 48 miles from N.W. by N. at 7 a.m., 17th, and fresh N.N.W. winds were experienced even as far south as Falmouth. Aurora was again seen at Aberdeen in the evening. At 8 a.m., 17th (Fig. 34), the depression had crossed Denmark, and as the barometer began to rise again on our coasts the wind veered further northwards, and extended down our east coast as a strong breeze. A westerly gale had set in at Cuxhaven and on the Dutch coast; rain fell in the north, and the weather was cloudy and squally generally. At Brighton a peculiar and heavy cloud appeared, accompanied by a squall of hail and wind.

April 18. (Fig. 35.) The mercury had risen nearly 0·4 inch in Caithness, and the wind was generally northerly. It is to be noted that though the gale had now moderated on the Dutch coasts, at our eastern stations and in the Irish Sea the wind continued strong and squally throughout the day, with showers of hail and inclement weather. Unfortunately the velocity pencil of the Alnwick Castle anemometer was broken, so that the trace for this part and the remainder of the month is lost. The northern increase of pressure now extended southwards, and while it proceeded slowly at the southern and south-eastern stations, a decrease of pressure commenced in the west.

April 19. At 8 a.m. pressure varied from nearly 30·2 ins. in the west of Ireland to 29·65 ins. in the south of France, and 29·7 ins. on the eastern shores of the North Sea. Moderate to fresh winds, drawing from N. to N.E., were reported from all our coasts, and easterly breezes from the west of France. The Irish barometers were, however, falling, the change becoming rather rapid shortly after noon. In the night of the 19th–20th a well-defined depression advanced on the west coast of Ireland, apparently from the north-westward, and at 8 a.m. on the 20th its centre lay over the centre and south-east of that island. On referring to Plates XXII. and XXIII. it will be seen that the depression, continuing in its south-south-easterly or south-easterly course, passed between Valencia and Armagh, the wind at the former observatory *veering* from S.W. to W. and N., while at the latter it *backed* from S. (at 2 a.m.) to E. and E.N.E. The winds which formed the circulation round the disturbance were not strong as yet, though the circulation itself was complete. At 6 p.m., 20th (see Fig. 36, Plate XXII.), the depression lay off the south coast of Ireland, and its influence was becoming much more marked. The barometer now fell briskly in the south of England and north of France, while it rose at our north-western stations, and at 8 a.m., 21st, the depression was found over the north of France, near Havre, Fig. 37, Plate XXIII. The increased gradients over our islands produced strong north-easterly winds and fresh gales in many places, blowing with a velocity of 60 miles an hour at Holyhead, with continued showers in the south, snow and hail in Scotland. The course of the storm now changed rather suddenly to the north-westward, so that at 6 p.m., 21st, its centre seems to have been situated near Portland, at which time

north-easterly gales prevailed along our eastern coasts and strong northerly winds in the west. The rise of temperature at Kew which accompanied the veering of the wind to South, consequent on this alteration in the direction of motion of the centre, is very considerable, the change between 7 a.m. and 4 p.m. amounting to about 23°. During the night the direction followed by the disturbance again changed to the westward, and at 8 a.m., 22nd, its centre lay near Scilly, Fig. 38, Plate XXIII. The increased rapidity of the barometric fall at Falmouth as the disturbance again passed by the observatory is very distinctly marked; while the continued *backing* of the wind from N. (at 3 p.m., 21st), through W., to S. and S.S.E., shows that the path it followed lay to the northward of the observatory. Heavy rain fell all along our southern coasts, the amount at Falmouth being *very* large at the time of the minimum pressure, and accompanied by frequent rapid shifts of wind; the total rainfall for the 24 hours, ending 10 a.m. 22nd, being 1·5 ins.

Between 8 a.m. 22nd and the same hour on the 23rd (Fig. 39, Plate XXIII.), little change seems to have occurred in the position of the disturbance, but as the 23rd advanced it continued to move in a north-westerly direction, the depression in the meantime "filling up" quickly, and the whole finally disappearing to the westward of Ireland, leaving southerly and westerly breezes in its rear. The very unusual track of the storm above noticed differs in some particulars from that assigned to it by the authorities at the Paris observatory (*vide* the chart for April 21, published as an appendix to the Bulletin International). The evidence afforded by the British observatories shows that the exact track suggested for it in the Bulletin cannot be maintained.

Annexed is a table showing the more marked changes of wind in the gale as registered by the various anemometers.

| Observatories, April 20-22. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 10 p.m. (20th). | N.E. by E. | — | — | — | — | 3 p.m. (22nd) | N. by E. | 41 | 1 a.m. (21st). | N.E. | 45 | Velocity *occasionally* exceeded 40 miles between 1 and 6 a.m. 21st, and between 4 and 10 a.m. 22nd, but did not continue so for long. |
| Aberdeen | 10 a.m. (21st). | E.N.E. | 3 a.m. (22nd). | E.N.E. | 41 | 7 | 3 p.m. (22nd) | E.N.E. | 29 | 4 a.m. (22nd). | E.N.E. | 43 | — |
| Falmouth | 10 p.m. (20th). | E. by S. | — | — | — | — | 3 a.m. (21st) | N.E. by N. | 5 | Midgt. (20th). | E.N.E. | 42 | For 1 hour only. Wind continued fresh till 6 p.m. 21st, backing to N. |
| | 10 a.m. (22nd). | S. | — | — | — | — | 5 p.m. (22nd) | S. by E. | 7 | 11 a.m. (22nd). | S. by E. | 41 | For 1 hour only. Wind continued fresh from S.S.W. till 4 a.m. 23rd. |
| Holyhead | 3 a.m. (21st). | N.E. by E. | 7 a.m. (21st). | N.E. | 50 | 23 | 6 a.m. (22nd) | E.N.E. | 27 | 8 p.m. (21st). | N.E. | 60 | — |
| | 1 p.m. (22nd). | E.N.E. | — | — | — | — | 8 p.m. (22nd) | E. by N. | 7 | 2 p.m. (22nd). | E.N.E. | 34 | — |
| Yarmouth | 6 p.m. (20th). | E.N.E. | 10 p.m. (20th). | N.E. | 47 | 14 | 8 p.m. (21st) | E. by S. | 26 | 5 a.m. (21st). | N.E. by N. | 54 | — |

At Sandwick, Glasgow, Stonyhurst, and Halifax more or less of fresh to strong N.E. winds were registered on the 21st, but the instrument at Alnwick Castle being out of order we are without the details as to velocity, though the direction of the wind was north-easterly, and in force it was *apparently* strong. At Dublin a severe north-easterly gale occurred on the night of the 21st, with sleet and rain to the amount of 1·28 ins., which may be attributed to the resilience of the storm above noticed. Precipitation was large generally, except in the most northern parts of our islands; and while the north-easterly winds were blowing on the north-western side of the depression strong south-westerly breezes and rain prevailed in France, which subsequently moderated and slowly extended to our stations also. Thunderstorms occurred at Stonyhurst on the 23rd, and at several of our northern stations on the 24th.

At 8 a.m. on the 25th all trace of the recent disturbance had disappeared. Pressure varied from nearly 30 ins. in the east of France to about 29·4 ins. in the west of Ireland, the gradients being very regular and the barometer rising everywhere. In the afternoon a rather sudden oscillation occurred on our S.W. coasts, lasting several hours, and being accompanied by rain and an increase of the wind to a strong breeze at Falmouth. Nothing of the kind occurred at the other observatories, though thunder and lightning were recorded at Nairn, Stonyhurst, and several of the southern stations, and some rain fell generally.

April 26. A slight fall of the barometer had taken place in the north-west during the night, though readings were higher everywhere than on the previous morning. The southerly wind freshened a little in most places—notably at Holyhead—but soon veered and moderated again, with a renewal of the increase of pressure in the west and north. Some showers which fell in the afternoon at Stonyhurst and Armagh were accompanied by thunder and lightning, and caused sudden oscillations of temperature at those places. Lightning was seen at Kew in the evening, aurora at Sandwick.

On the morning of the 27th a shallow depression was observed over the north-west of France, while on our western and northern coasts the mercury had risen. The wind was light, but backed to the eastward in England and the Channel, though in Ireland it remained southerly, and moderate south-easterly breezes prevailed in central France. The depression then travelled north-eastwards across England, and lay off our north-east coasts on the morning of the 28th. At Kew the wind, as it veered to S., caused a considerable rise of the thermometer (*see* Plate XXIV.), but as the veering continued through W. towards N., an equally marked diminution occurred. Until the end of the month little further change took place. A large anticyclone, whose maximum readings exceeded 30·4 ins., formed over the North Sea, south of England, and north of France by the 30th, to the northward of which moderate to fresh southerly breezes prevailed, while to the southward north-easterly winds were reported.

May 1. The band of high readings still lay in the position mentioned on the 30th of April, and a small anticyclone, whose maximum pressure was slightly above 30·4 ins.,

was found near Yarmouth, fine weather being prevalent on all but our north and west coasts, where the southerly wind was rather fresh. The barometer was falling generally, though no serious change was observed until midnight of the 2nd. The mercury then began to fall quickly, the change commencing in the west and north-west, and at 8 a.m. 3rd (the highest readings being then over the Bay of Biscay, and the lowest in Norway) southerly and south-westerly winds had become general in our islands, with cloudy weather. These winds were very fresh on all our western and northern coasts, and at Valencia and Holyhead they rose to 47 miles an hour during the day, but with very little rain; while in the west of France moderate north-easterly breezes were as yet reported. After a slight interruption of the barometric fall, occurring before noon at Valencia, and subsequently in Great Britain, it again became rapid, and at 8 a.m. on the 4th the centre of a deep depression lay over the west of Scotland (*see* Fig. 40, Plate XXV.). The gradient from Portsmouth to Ardrossan was 0·10 in. per 50 miles, but in France pressure was more uniform. The wind swept round the region of lowest pressure, blowing a moderate gale from S. in Scotland, fresh to strong breezes from S.W. in England, with fresh westerly winds in Ireland. At Holyhead the maximum hourly velocity recorded was 52 miles from S.S.W. at 7 a.m., but at no other station did it reach even 40 miles. In some parts of England, however, very severe squalls were reported, notably near Ulceby, in Lincolnshire, where the force was estimated as 10 (by Beaufort scale), both at noon and 3 p.m.

Temperature fell a little almost everywhere, but the rainfall was not generally great. The minimum pressure occurred at all the observatories on the 4th, and on the following morning the centre of the storm had travelled considerably to the north-eastward of Scotland, on its way towards Norway. The recovery which ensued was rather rapid, except in the south, where the barometer remained very steady. The weather continued showery.

During the 6th and 7th a very general and gradual fall of the mercury occurred in all parts of the kingdom, and the undulations shown in the Valencia barogram about this time seem to indicate the passage of some minor depressions which skirted the Irish coast as they travelled north-eastwards or north-north-eastwards, causing fresh westerly breezes in the western portions of our islands. At Falmouth they even reached the velocity of 44 miles an hour at 4 p.m. 7th. The last of these depressions became much more marked as it advanced towards Norway; for, being succeeded by a rapid rise of the barometer over our islands, rather steep gradients were formed on its western and south-western sides: and at 8 a.m. 8th, strong W. to N.W. winds swept over our southern and south-western stations, while moderate N.N.E. winds had set in over Scotland. The weather remained showery, and thunderstorms occurred in many places. The variations of temperature occurring near mid-day at all the observatories, from the 5th to the 11th, are very marked, and seem to have been generally accompanied by distinct oscillations in the direction of the wind, and showers in many places. *See* Plate XXVI. During the 9th and 10th the general increase of pressure already noticed continued rapidly, but readings attained their

maximum on the night of the latter day, and a slow unsteady change set in. In the meantime temperature decreased somewhat; and showers of hail, with thunderstorms, were *very* prevalent on our coasts.

May 11. At 8 a.m. barometrical readings exceeded 30·3 ins. in Ireland, the west and north of Scotland, and the west of Norway, while at Fanö the barometer had fallen to 29·87 ins. In the south of France also the mercury had begun to fall, while in Norway it was rising. Temperature decreased somewhat in the east and south, but the mid-day irregularities recently noticed began to disappear from the western and northern thermograms. Northerly winds prevailed throughout the kingdom, blowing rather strongly in the north-east of Great Britain, with showers of snow and hail in many places, and drawing round to a moderate N.E. wind in the Bay of Biscay. During the day the barometer continued to fall not only in France, but fell also on our own coasts and at Christiansund, while the rise recently noticed in the west of Norway travelled to Denmark. The decrease in the north and west was, however, only temporary, and was succeeded by a recovery on the 12th, with cloudy weather and some rain.

At 8 a.m. 13th a small but well-defined depression appeared over Belgium and the extreme south-east of England, where the barometer fell nearly 0·3 in., while in Scotland it had risen by about the same quantity. North-easterly winds were general in Great Britain, and northerly breezes in Ireland and the Bay of Biscay, while light west-south-westerly winds were reported from Paris and Brussels. On our east coasts and over the North Sea the wind was strong, blowing a gale with rain at Fanö, Helder, and Yarmouth. The direction pursued by the depression during the next few days was very unusual. By 8 a.m. 14th it seems to have travelled westwards to the neighbourhood of the Channel Islands and the north-west of France. (The observations taken by Dr. Hoskins in Guernsey prove, however, that the centre did not pass to the westward of that island, where a bleak N.E. wind prevailed all day, with nearly an inch of rain.) In this position it remained during the day, causing a N.E. wind, with a maximum velocity of 50 miles an hour, to prevail at Yarmouth, while 42 miles from the same quarter was registered at Holyhead in the evening. The disturbance then returned eastwards, so that by 8 a.m, on the 15th it lay over the Straits of Dover and the neighbouring shores. It now took a more northerly path, and on the following morning was found near the Dogger Bank. As, however, pressure had now begun to give way on our south-west coasts, the gradients on the south-western side of the depression became less steep, and the winds, which at first were so strong from N.E. on our east coast, and then moderated as they backed to N.W., now fell very light and variable at the western and southern stations. The weather was very wet in the south and south-east during the whole period, and showery elsewhere; but temperature was almost stationary.

May 17. A rather rapid fall of the barometer having occurred in the west of Norway as well as over the north of Spain, the Bay of Biscay, and the north of France, the

following conditions were presented at 8 a.m. The barometer stood at about 29·8 ins. both on our north-west coasts and over the south and south-east of France. Between these two regions of high pressure ran a band where readings were as low as 29·6 ins., terminated at its north-eastern extremity by a depression (near Skudesnaes), in which readings were down to 29·4 ins., and at its south-western extremity by a second depression (near Corunna), with readings equally low. Fresh N. to N.E. winds prevailed at Christiansund, over our islands, and at Brest; light south-westerly and southerly breezes in central France and the south of Norway. Whether the more northern of these depressions was the same as that noticed during the past few days (only more marked), or whether it was altogether a newly-formed disturbance, the observations at present in hand are not sufficient to show with certainty, but appearances favour the former view of it. Rain had fallen heavily in the east of Scotland and a little elsewhere, but the sky had begun to clear in the north.

On the morning of the 18th both depressions had travelled north-eastwards; the most northern one had passed almost outside the area for which we have authentic observations, while the southern one had advanced over the north of France. The barometer had thus fallen slightly at our southern stations; the fresh northerly winds still held on our east coast, while the north-easterly wind in the Channel gained strength. The weather was still wet and cold. During the day the French disturbance continued on its journey to the east-north-eastward, and pressure rose at our southern stations. In the night the thermometer exposed on grass fell to 27·5° F. in the south of London. The regularity of the fall exhibited by the Kew thermograms between the 16th and 19th is very remarkable. Plate XXVIII.

From this time until the 28th the changes of pressure were very slight. At 8 a.m. on the 19th a new depression showed itself near Christiania, but disappeared by the 20th, when two others appeared—one off the north-west coast of Scotland, the other at the mouth of the English and St. George's Channels, causing some slight undulations in our south-western barograms. After the 20th the barometer rose slowly and steadily at all stations for a week, but until the 25th the weather remained rather showery in the north of the kingdom, with thunder and hail occasionally in various places. Considerable oscillation is shown in the thermograms during the daytime, and the coincidence of local showers with changes of temperature is very well marked in the Falmouth and Stonyhurst thermograms on the morning of the 19th, and at Armagh about noon, while a similar result is shown at Glasgow on the 22d. It will be observed that these oscillations were accompanied by considerable variations in the direction of the wind. At Aberdeen a singular fall of the thermometer, and subsequent recovery, occurred in the afternoon of the 26th, with a *backing* of the wind completely round the compass, but apparently unaccompanied by rain.

May 28. The barometer commenced falling in the west, and subsequently in the north, accompanied by the backing of the wind to S.W. and its freshening considerably.

On the morning of the 29th a depression lay apparently to the north-westward of Scotland, producing fresh southerly winds on our north and north-west coasts, but the disturbance was slight and had passed off by the following morning. A little rain fell in the west and north on the 28th, and extended over England next day. In the south of England, however, severe thunderstorms occurred and very large hailstones fell. The month closed with comparatively uniform barometrical readings, moderate W. to N.W. breezes, and fine weather, except in some parts of Ireland and Scotland.

June brought a sudden change to our coasts, although at 8 a.m. on the 1st the highest pressures were still found over the Bay of Biscay. The barometer was, however, then falling slowly in Ireland, and as the day advanced the change became more rapid. The wind (which had been north-westerly) backed quickly to the southward and increased considerably, with rain, but the force of a gale was not reached at any station.

At 8 a.m. on the 2nd the south-eastern portion of a large depression lay over Scotland and the northern parts of England and Ireland, but the gradients were not very steep. The wind had veered to N.W. again on our south-west coasts, but drew round, through S.W. in the south-east of England, to S.S.E. in the north of Scotland. Rain had been general, heavy in the west, and continued to fall in the south-east of England. During the day the disturbance underwent some modifications, and travelling slowly, in an easterly direction, it was found off the east coast of Scotland at 8 a.m. on the 4th, but had become so ill-defined as to be scarcely discernible. The barometer rose briskly in the west and north, where showery weather continued; while in the south the weather improved. The wind veered to N.W. and blew freshly, reaching a velocity of 44 miles at Holyhead. Thunder showers occurred near Canterbury on the 3rd.

Between the 5th and 9th the barometric column descended slowly all over the country, the change being accompanied by a number of minor oscillations, some of which were very decided, though occupying only a few hours in passing (*see* Plate XXXII., and especially the curves for Aberdeen, Stonyhurst, and Falmouth). Until the 8th barometrical readings were *generally* lowest in the north-west and highest in France, so that the most prevalent winds were south-westerly. There were, however, considerable local variations, those shown by the curves for Aberdeen and Glasgow on the 6th, Stonyhurst on the 7th, being well marked. The two former were accompanied by rain, that at Stonyhurst next day by a thunderstorm; and thunderstorms occurred in many other parts of the country also during the day.

On the morning of the 8th the S.W. wind became very strong and squally over the Channel and north of France, while a rather strong E.S.E. breeze swept across the North Sea from Denmark to Scotland. At Falmouth the velocity increased to 47 miles an hour at 11 o'clock, and Holyhead had over 30 miles an hour all the morning. Rain had fallen on all but our north-west coasts. A very distinct concavity is observed in the Falmouth barogram between 6 a.m. and noon, which is repeated at Stonyhurst about nine hours later, and the following morning at Aberdeen. In each case the

*descent* of the column was accompanied by squalls and rain, the latter being heavy at Falmouth and Aberdeen.

At 8 a.m., 9th, a well-defined depression showed itself over the south-east of Ireland and the mouth of St. George's Channel, where the mercury had fallen about 0·3 in. in the 24 hours. The steepest gradients were on its S. and S.W. sides, that from Valencia to Roche's Point being 0·18 in. per 50 miles. The wind circulated round the area of lowest readings, being easterly at our north-western stations, northerly in the south of Ireland, westerly to south-westerly in the English Channel, and southerly on our east coast. At Sandwick the velocity increased to 40 miles from S.E. at 1 p.m., while W.S.W. 42 miles occurred at Falmouth three hours later. Rain fell generally and thunderstorms occurred in several places.

By 8 a.m., 10th, the disturbance had travelled northwards to the lowlands of Scotland, but gradients being less steep than on the 9th the winds were generally lighter; the weather was, however, still showery and cold for the time of year. During the next few days the disturbance slowly disappeared; but on the 11th a new shallow depression crossed from W. to E. over Ireland and England, causing the slight concavities shown in the Valencia and English barograms, and keeping the weather in an unsettled condition. Violent hailstorms occurred at Brighton early in the morning, a thunderstorm took place at Aberdeen in the afternoon, and in the Channel a rather strong westerly breeze prevailed, which reached the velocity of 42 miles at Falmouth in the afternoon.

On the morning of the 12th the centre of this new depression was over the North Sea, and a rise of the barometer set in which continued until the 16th, the wind in the meantime falling light and the weather becoming very fine and warm in England, though in Ireland and some parts of Scotland it remained showery, except on the 13th. With this period of fine weather the regular diurnal range of temperature and wind-velocity became restored, most notably in England; and the prevailing winds were southerly.

Between the 16th and 18th a gradual decrease of pressure occurred throughout the north-west of Europe, but so uniform was the change that scarcely any alteration occurred in the general direction or velocity of the wind. The weather was exceedingly warm in England on the 17th and 18th, and both days were marked by the prevalence of thunderstorms of great violence in many parts of England, chiefly in the southern or midland counties, which lasted at several places through part of the following day.

Fog was very prevalent in the west and north, as is abundantly shown by the absence of daily range in the thermograms at most of the stations.

June 19. The mercury reached its lowest point at all the observatories, and a recovery commenced which lasted till late on the 20th. The change was accompanied by many local oscillations of the mercury and heavy thunderstorms. The rain was very heavy in most places (*e.g.* at Glasgow), and the oscillations of wind were sudden, and apparently irregular. The storms reported in the southern parts of the country

appear to have been connected with a local depression which moved from the westward, and at 8 a.m., 19th, lay near Portsmouth, whence it passed on slowly to the Helder, which it had reached by 8 a.m. 21st. During the afternoon of the 19th some additional disturbance seems to have occurred in the extreme north of our islands, causing a south-easterly breeze of 40 to 45 miles an hour at Sandwick in the afternoon, followed by a lull and the subsequent shifting of the wind to the northward.

June 21. Pressure had increased somewhat during the two previous days; but during the night of the 20–21st the recovery on our south-east coasts, from the local disturbance recently felt there, had been accompanied by a rather rapid fall of the mercury in the west, *see* Plate XXXV., and a depression showed itself over Ireland, with fresh to strong squally winds circulating round it. Clouds again increased in the west, and subsequently in most other parts of the country. A thunderstorm occurred at Stonyhurst, and rain fell at nearly all stations. On the morning of the 22nd the centre was off the north-east coast of Scotland, the minimum readings having been registered at Valencia at 6 a.m. 21st, Armagh 3 p.m., Glasgow (where two distinct minima are shown, *see* Plate XXXV.) about 3 a.m. 22nd, and at Aberdeen about 6 a.m. The wind at Ardrossan rose to a strong gale from W.N.W. as the centre passed to the north-eastward of that station, and a decided increase was recorded at nearly all the more northern stations. At Alnwick the velocity fluctuated between 20 and 43 miles an hour all day.

June 23. A considerable increase of pressure was shown by barometrical readings in the north-east of Great Britain, and a less change on the other coasts. A large anticyclone had formed over the north of France and the south of England, but in the south of Ireland a new diminution had commenced, which became general by the following morning. The wind backed to S. or S.W. again, and freshened as the fall continued, the velocity exceeding 30 miles an hour both at Valencia and Sandwick; but late on the 24th, as the disturbance moved northwards, a recovery set in over the south of Ireland with fresh west-north-westerly winds, while strong W.S.W. breezes prevailed in France and moderate easterly in Norway. Rain fell in most places, and thunderstorms occurred on the 24th in the south and south-east of England.

During the 25th the barometrical recovery extended slowly to all our coasts, together with the veering of the wind and rather finer weather, which continued (with the exception of thunder showers in the west and north) until the 27th.

On the 27th, however, a new depression advanced over Ireland, and by 8 a.m. on the 28th had travelled to Scotland, where readings fell nearly to 29·4 ins. Thus a return of strong southerly winds (which exceeded 45 miles an hour at Valencia and Holyhead) and heavy rain, was occasioned generally, the fall at Greencastle amounting to nearly an inch and a quarter on the 27th, and in many parts of Scotland to about an inch on the 28th. As usual the wind veered westwards as the disturbance passed off, and on

the morning of the 29th, when it had reached Norway, the weather had improved considerably in the United Kingdom.

Nevertheless the evening brought further change; and a new depression passed over us, just touching our western coasts at 8 a.m. 30th, and also travelling in a north-easterly direction. As usual the southerly and south-easterly winds returned for a time, blowing very freshly in the west, and attaining a velocity of 44 miles an hour at Valencia. With them rainy weather was again felt on our coasts. Faint aurora was seen at Brighton in the evening of the 30th.

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## Remarks.

*Wind.*—

The following is the table of hours in which the velocity was 30 miles an hour or upwards, drawn up as in the previous reports :—

| Observatories. | April. | May. | June. | Total. | Observatories. | April. | May. | June. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| Valencia - - | 85 | 56 | 80 | 221 | Holyhead - - | 208 | 104 | 82 | 394 |
| Armagh - - | 0 | 7 | 0 | 7 | Stonyhurst - | 12 | 3 | 0 | 15 |
| Glasgow - - | 44 | 12 | 11 | 67 | Halifax (Moorside) | 15 | 2 | 0 | 17 |
| Aberdeen - - | 89 | 1 | 10 | 100 | Alnwick Castle - | 33 | 6 | 37 | 76 |
| Sandwick - - | 155 | 29 | 72 | 256 | Kew - - - | 1 | 1 | 3 | 5 |
| Falmouth - - | 63 | 57 | 43 | 163 | Yarmouth - - | 38 | 44 | 4 | 86 |

In the above table there is little calling for remark beyond the marked excess of wind at Holyhead as compared with the other stations, and the general prevalence of strong winds in April as compared with May and June.

*Pressure.*— April.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | D. H. | Inches. | D. H. | Inches. |
| Valencia - - | 29·962 | + ·040 | 30·377 | 8th, midngt. | 29·117 | 23rd, 9 a.m. | 1·260 |
| Armagh - - | 29·949 | + ·045 | 30·407 | 5th, midngt. | 29·156 | 23rd, 5 p.m. | 1·251 |
| Glasgow - - | 29·901 | + ·008 | 30·423 | 5th, midngt. | 29·297 | 23rd, 4 p.m. | 1·126 |
| Aberdeen - - | 29·872 | − ·044 | 30·422 | 5th, 11 p.m. | 29·395 | 23rd, 4 a.m. | 1·027 |
| Falmouth - - | 29·962 | − ·041 | 30·512 | 6th, 9 p.m. | 28·872 | 22nd, 7 a.m. | 1·640 |
| Stonyhurst - | 29·927 | + ·035 | 30·501 | 6th, 7 a.m. | 29·156 | 22nd, 4 a.m. | 1·345 |
| Kew - - - | 29·941 | − ·027 | 30·514 | 6th, 10 a.m. | 29·063 | 21st, 5 p.m. | 1·451 |

In April pressure was rather in excess of the average at the western and north-western observatories, and in defect elsewhere, although the actual maximum readings occurred in the south of England. In consequence of the low reading at Falmouth on the 22nd, the range was greatest at that observatory.

## May.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | D. H. | Inches. | D. H. | Inches. |
| Valencia - - | 29·997 | + ·136 | 30·462 | 26th, 10 p.m. | 29·404 | 7th, 4 a.m. | 1·058 |
| Armagh - - | 29·922 | ·000 | 30·419 | 10th, 11 p.m. | 29·132 | 4th, 5 a.m. | 1·287 |
| Glasgow - - | 29·858 | — ·051 | 30·351 | 10th, 9 p.m. | 28·882 | 4th, 1 p.m. | 1·469 |
| Aberdeen - - | 29·833 | — ·119 | 30·344 | 10th, 9 p.m. | 28·891 | 4th, 3 p.m. | 1·453 |
| Falmouth - - | 29·976 | — ·029 | 30·456 | 27th, 8 a.m. | 29·475 | 7th, 7 a.m. | 0·981 |
| Stonyhurst - - | 29·901 | — ·007 | 30·390 | 26th, 10 p.m. | 29·223 | 4th, 1 p.m. | 1·167 |
| Kew - - - | 29·922 | — ·044 | 30·393 | 27th, 8 a.m. | 29·399 | 7th, 11 a.m. | 0·994 |

Pressure was again slightly in excess over Ireland, though perhaps the large difference from the average shown at Valencia may be owing partly to the fact that the average itself (though the best obtainable at present) is obtained from too few observations for it to be as good as could be wished. In the north the highest readings occurred on the 10th, but elsewhere on the 26th or 27th; while the minimum pressure took place on the 4th in the north and north-west, and on the 7th elsewhere. The range was not great, especially in the south of England.

## June.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | D. H. | Inches. | D. H. | Inches. |
| Valencia - - | 29·882 | — ·223 | 30·248 | 4th, noon. | 29·279 | 9th, 3 a.m. | 0·969 |
| Armagh - - | 29·809 | — ·108 | 30·232 | 16th, 9 a.m. | 29·225 | 9th, 5 a.m. | 1·007 |
| Glasgow - - | 29·760 | — ·129 | 30·238 | 16th, 10 p.m. | 29·258 | 10th, 5 a.m. | 0·980 |
| Aberdeen - | 29·773 | — ·148 | 30·242 | 16th, 2 p.m. | 29·281 | 9th, 4 a.m. | 0·961 |
| Falmouth - | 29·950 | — ·097 | 30·328 | 16th, noon | 29·358 | 9th, 7 a.m. | 0·970 |
| Stonyhurst - | 29·831 | — ·089 | 30·284 | 16th, 11 a.m. & noon. | 29·169 | 9th, 7 p.m. | 1·115 |
| Kew - - | 29·915 | — ·065 | 30·307 | 16th, 8 a.m. | 29·407 | 9th, 5 p.m. | 0·900 |

In June barometrical readings were everywhere below the average, especially in the west and north. The maximum pressure occurred everywhere, except at Valencia, on the 16th, and the minimum on the 9th or 10th. The range was small, but was greatest at Armagh and Stonyhurst, where the minimum of the 9th was most marked.

*Temperature.*—

## April.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | D. H. | ° | D. H. | ° |
| Valencia - - | 48·6 | −0·6 | 59·9 | 14th, 3 p.m. | 34·1 | 4th, 6 a.m. | 25·8 |
| Armagh - - | 46·3 | −1·0 | 60·9 | 10th, 1 p.m. | 31·7 | 3rd, 6 a.m. | 29·2 |
| Glasgow - - | 45·7 | +0·8 | 59·1 | 12th, noon. | 32·7 | 19th, 4 a.m. | 26·4 |
| Aberdeen - - | 44·9 | +1·8 | 59·1 | 14th, 2 p.m. | 34·0 | 20th, 10 p.m. | 25·1 |
| Falmouth - - | 48·2 | — | 58·8 | 15th, 3 p.m. | 36·8 | 20th, 4 a.m. | 22·0 |
| Stonyhurst - - | 45·7 | +1·2 | 62·8 | 12th, noon. | 32·3 | 20th, 3 a.m. | 30·5 |
| Kew - - - | 48·5 | +2·3 | 66·8 | 27th, 2 p.m. | 29·6 | 20th, 6 a.m. | 37·2 |

The weather was rather warmer than the average in Great Britain, and slightly colder in Ireland. The various maxima were recorded on very different days, but except in Ireland and at Glasgow the minima were noted on the 20th. The range was much larger at Kew than elsewhere.

## May.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | D. H. | ° | D. H. | ° |
| Valencia - - | 50·7 | −2·2 | 64·8 | 14th, 3 p.m. | 40·0 | 10th, 4 a.m. | 24·8 |
| Armagh - - | 48·2 | −4·0 | 62·4 | 26th, 2 p.m. | 33·2 | 12th, 5 a.m. | 29·2 |
| Glasgow - - | 47·5 | −2·9 | 61·0 | 26th, 4 p.m. | 32·9 | 21st, 5 a.m. | 28·1 |
| Aberdeen - - | 47·4 | −0·8 | 65·0 | 26th, 4 p.m. | 34·8 | 18th, 4 a.m.<br>19th, 4 a.m. | 30·2 |
| Falmouth - - | 50·4 | — | 63·1 | 26th, 5 p.m.<br>28th, 2 p.m. | 36·6 | 12th, 4 a.m. | 26·5 |
| Stonyhurst - - | 48·3 | −1·6 | 64·1 | 1st, 3 p.m. | 34·8 | 19th, 3 a.m. | 29·3 |
| Kew - - - | 51·0 | −2·0 | 70·4 | 27th, 6 p.m. | 32·5 | 20th, 4 a.m. | 37·9 |

May was cold everywhere, though rather high temperatures were recorded about the 26th, on which day the maximum heat occurred at all the northern observatories. The shade temperature did not fall below the freezing point at any of the observatories. The range was greatest at Kew.

## June.

| Observatory. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | D. H. | ° | D. H. | ° |
| Valencia - - | 55·2 | −1·5 | 66·2 | 20th, 5 p.m. | 45·0 | 6th, 4 a.m. | 21·2 |
| Armagh - - | 55·1 | −3·0 | 71·5 | 16th, 3 p.m. | 41·0 | 6th, 2 a.m. | 30·5 |
| Glasgow - - | 54·8 | −1·0 | 75·1 | 18th, 2 p.m. | 41·9 | 3rd, midngt. | 33·2 |
| Aberdeen - - | 53·9 | −1·1 | 65·1 | 14th, 3 p.m.<br>18th, 9 a.m. | 43·2 | 4th, 1 a.m. | 21·9 |
| Falmouth - - | 56·5 | — | 70·2 | 17th, 1 p.m. | 46·0 | 6th, midngt. | 24·2 |
| Stonyhurst - - | 55·9 | +1·2 | 79·2 | 18th, noon. | 37·2 | 7th, 3 a.m. | 42·0 |
| Kew - - - | 59·7 | +0·6 | *83·4 | 18th, 3 p.m. | 42·6 | 7th, 4 a.m. | 40·8 |

* Rather doubtful; trace indistinct, noon to 6 p.m.—from *very* high temperature.

June also was a cold month in Ireland and Scotland, but slightly warmer than the average in England. This latter result seems to be owing to the hot period which culminated in the great heat of the 18th, on which day the thermometer rose above 83° at Kew. In fact the maximum temperature for the month was reached at all places between the 16th and 20th, while the minimum occurred between the 3rd and 7th. The range at Kew and Stonyhurst was very large, but both the maximum and minimum readings at the latter observatory were about 5° lower than those at the former. The maximum temperature at Aberdeen, as well as at Valencia, is very singular when compared with those at the other observatories. The reason of this is to be found in the prevalence of fog on the 17th and 18th, as already explained.

The difference between the five-day mean temperatures at Kew and the Greenwich averages is given below.

| Date. | Variation. | Date. | Variation. | Date. | Variation. |
|---|---|---|---|---|---|
| | ° | | ° | | ° |
| April 1–5 | − 0·1 | May 1–5 | + 2·3 | May 31–June 4 | − 3·6 |
| „ 6–10 | + 3·6 | „ 6–10 | − 4·1 | June 5–9 | − 3·1 |
| „ 11–15 | + 7·2 | „ 11–15 | − 3·6 | „ 10–14 | − 0·1 |
| „ 16–20 | − 3·1 | „ 16–20 | − 6·4 | „ 15–19 | +10·1 |
| „ 21–25 | + 1·7 | „ 21–25 | − 3·0 | „ 20–24 | + 2·7 |
| „ 26–30 | + 4·6 | „ 26–30 | + 4·2 | „ 25–29 | − 3·0 |

In this table the two warm periods in April, and the very warm days in June, are very distinctly shown.

## RAIN.

The table on p. 57 is compiled similarly to that given in Part I.

In the months of April and May the rainfall seems to have been very unevenly distributed, some stations having a large excess, while others experienced a comparative drought; but in June the weather was wet everywhere except at Kew, which seems to have been an exception to the rule. The falls of more than an inch in 24 hours were most frequent in June, and were generally accompanied by thunder and lightning.

# RAINFALL, 1872.

| Positions of Gauges. | | | April. | | | | | | | May. | | | | | | | June. | | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Names of Stations. | Height of Gauge. Above Ground. | Height of Gauge. Above Mean Sea Level. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | |
| | ft. in. | ft. | | | | | | | | | | | | | | | | | | | | | | |
| **Observatories.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Valencia | 2 0 | 11 | 20 | 1·62 | −1·83 | 0·45 | 21st | 0 | – | 17 | 2·09 | −0·91 | 0·46 | 1st | 0 | – | 23 | 6·28 | +3·44 | 0·67 | 29th | 0 | – | |
| Armagh | 2 2 | 204 | 15 | 2·80 | +0·71 | 0·61 | 20th | 0 | – | 22 | 1·89 | −0·35 | 0·23 | 3rd & 15th | 0 | – | 23 | 3·36 | +1·23 | 0·69 | 8th | 0 | – | |
| Glasgow | 1 10 | 180 | 11 | 0·72 | −1·74 | 0·13 | 25th | 0 | – | 23 | 3·41 | +0·92 | 0·63 | 14th | 0 | – | 26 | 8·53 | +5·80 | 1·08 | 24th | 2 | 9th & 24th. | |
| Aberdeen | 2 0 | 48 | 15 | 2·78 | +0·71 | 0·73 | 27th | 0 | – | 20 | 3·45 | +1·63 | 0·73 | 14th | 0 | – | 21 | 3·29 | +1·83 | 0·54 | 7th | 0 | – | |
| Falmouth | 1 10 | 167 | 13 | 3·84 | +1·41 | 1·50 | 21st | 1 | 21st | 21 | 3·38 | +0·81 | 0·60 | 13th | 0 | – | 18 | 3·13 | +0·58 | 0·56 | 7th | 0 | – | |
| Stonyhurst | 1 9 | 377 | 20 | 3·67 | +1·22 | 0·66 | 27th | 0 | – | 25 | 3·14 | +0·74 | 0·51 | 6th | 0 | – | 26 | 5·17 | +1·47 | 0·80 | 24th | 0 | – | |
| Kew | 1 10 | 20 | 14 | 1·43 | 0·00 | 0·36 | 20th | 0 | – | 18 | 2·93 | +1·10 | 0·62 | 13th | 0 | – | 13 | 1·48 | −0·91 | 0·22 | 1st | 0 | – | |
| **Telegraphic Reporting Stations.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Shetland (Sumburgh Head). | 1 9 | 170 | 21 | 3·62 | +1·75 | 0·50 | 3rd | 0 | – | 18 | 3·10 | +1·71 | 0·55 | 24th | 0 | – | 18 | 4·90 | +3·81 | 1·43 | 26th | 1 | 26th | |
| Thurso | 1 9 | 25 | 26 | 3·26 | +1·49 | 0·54 | 7th & 12th. | 0 | – | 26 | 1·98 | +0·80 | 0·22 | 18th | 0 | – | 22 | 4·48 | +2·98 | 0·99 | 28th | 0 | – | |
| Wick | 1 9 | 100 | 17 | 1·82 | +0·48 | 0·30 | 12th | 0 | – | 17 | 1·24 | −0·07 | 0·30 | 21st | 0 | – | 19 | 5·43 | +4·18 | 1·30 | 22nd | 2 | 22nd & 28th | |
| Nairn | 1 2 | 44 | 15 | 0·75 | −0·93 | 0·21 | 17th | 0 | – | 18 | 3·44 | +1·85 | 0·74 | 16th | 0 | – | 25 | 5·28 | +4·09 | 1·15 | 7th | 2 | 7th & 25th. | |
| Leith | 1 2 | 21 | 8 | 1·40 | −0·08 | 0·60 | 27th | 0 | – | 19 | 3·20 | +1·37 | 0·96 | 14th | 0 | – | 23 | 3·49 | +2·09 | 0·49 | 27th | 0 | – | |
| North Shields | 10 0 | 107 | 13 | 0·95 | −0·87 | 0·48 | 20th | 0 | – | 19 | 1·01 | −1·12 | 0·16 | 22nd | 0 | – | 18 | 2·41 | +0·43 | 0·63 | 18th | 0 | – | |
| Scarborough | 1 0 | 130 | 13 | 2·02 | +0·22 | 0·87 | 21st | 0 | – | 12 | 2·36 | +0·63 | 0·62 | 8th | 0 | – | 18 | 2·30 | +0·69 | 0·29 | 19th | 0 | – | |
| Yarmouth | 5 2 | 24 | 17 | 3·25 | +1·70 | 0·93 | 2nd | 0 | – | 17 | 3·54 | +1·64 | 0·72 | 8th | 0 | – | 15 | 4·24 | +2·44 | 0·96 | 3rd | 0 | – | |
| Ardrossan | 1 2 | 13 | 10 | 0·87 | −1·71 | 0·18 | 7th | 0 | – | 24 | 3·04 | +0·66 | 0·56 | 3rd | 0 | – | 24 | 6·21 | +4·40 | 0·87 | 24th | 0 | – | |
| Greencastle | 7 6 | 70 | 20 | 3·86 | +1·48 | 0·84 | 1st | 0 | – | 25 | 3·34 | +1·40 | 0·84 | 7th | 0 | – | 23 | 4·85 | +2·78 | 0·71 | 14th | 0 | – | |
| Holyhead | ~~1 9~~ | ~~44~~ | 14 | 1·92 | +0·24 | 0·73 | 21st | 0 | – | 18 | 1·14 | −0·84 | 0·17 | 3rd | 0 | – | 22 | 4·98 | +3·83 | 0·79 | 1st | 0 | – | |
| Liverpool (Bidston Observatory). | 0 6 | 180 | 11 | 2·07 | +0·42 | 0·41 | 21st | 0 | – | 19 | 1·43 | −0·77 | 0·21 | 11th | 0 | – | 20 | 4·24 | +2·99 | 0·78 | 1st | 0 | – | |
| Roche's Point | 1 9 | 23 | 9 | 1·62 | −1·00 | 0·32 | 24th | 0 | – | 15 | 2·32 | −2·76 | 0·38 | 1st | 0 | – | 19 | 4·72 | +3·63 | 0·70 | 14th | 0 | – | |
| Pembroke | 1 2 | 125 | 16 | 2·30 | −0·55 | 0·47 | 22nd | 0 | – | 19 | 2·00 | −0·94 | 0·37 | 22nd | 0 | – | 19 | 4·71 | +2·62 | 1·19 | 18th | 1 | 18th | |
| Scilly | 1 9 | 100 | 14 | 2·73 | — | 0·48 | 21st | 0 | – | 16 | 1·54 | — | 0·58 | 19th | 0 | – | 18 | 3·44 | — | 0·46 | 18th | 0 | – | |
| Plymouth | 27 0 | 95 | 10 | 1·67 | −0·50 | 0·41 | 25th | 0 | – | 13 | 0·98 | −2·17 | 0·43 | 13th | 0 | – | 16 | 3·74 | +2·97 | 1·04 | 18th | 1 | 18th | |
| Portsmouth | 1 0 | 16 | 12 | 1·28 | −0·11 | 0·30 | 20th | 0 | – | 17 | 2·38 | +0·48 | 0·37 | 13th | 0 | – | 14 | 2·26 | +0·93 | 0·45 | 6th & 8th. | 0 | – | |
| Dover | 23 0 | 46 | 16 | 1·73 | — | 0·60 | 20th | 0 | – | 17 | 3·01 | — | 0·52 | 9th | 0 | – | 14 | 2·64 | — | 0·55 | 11th | 0 | – | |
| London | 1 3 | — | 16 | 1·02 | −0·42 | 0·26 | 21st | 0 | – | 17 | 3·30 | +1·42 | 0·70 | 13th | 0 | – | 14 | 2·32 | +0·87 | 0·68 | 26th | 0 | – | |
| **Extra Stations.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Barnstaple | 0 8 | 31 | 13 | 2·68 | +0·46 | 0·43 | 21st & 25th | 0 | – | 12 | 1·93 | −0·36 | 0·36 | 6th | 0 | – | 19 | 3·32 | +1·01 | 2·50 | 18th | 1 | 18th | |
| Dublin | 3 0 | 57 | 12 | 2·66 | +0·11 | 1·28 | 21st | 1 | 1st | 22 | 2·16 | +0·04 | 0·32 | 15th | 0 | – | 19 | 3·28 | +0·68 | 0·54 | 8th | 0 | – | |
| Enniskillen (Florence Court). | 13 0 | 300 | 13 | 1·56 | −1·09 | 0·26 | 25th | 0 | – | 21 | 3·33 | +1·12 | 0·63 | 20th | 0 | – | 24 | 5·17 | +2·77 | 0·70 | 21st | 0 | – | |
| Galway | 8 2 | 30 | 12 | 1·70 | −1·31 | 0·35 | 7th | 0 | – | 21 | 2·30 | −1·35 | 0·30 | 2nd | 0 | – | 27 | 6·09 | +3·20 | 0·87 | 21st | 0 | – | |
| Guernsey | 12 0 | 204 | 10 | 2·19 | +0·35 | 0·58 | 27th | 0 | – | 15 | 4·05 | +1·48 | 0·93 | 13th | 0 | – | 18 | 3·23 | +1·76 | 0·64 | 1st | 0 | – | |
| Helston | 5 0 | 115 | 13 | 3·61 | +1·27 | 1·15 | 21st | 1 | 21st | 17 | 2·49 | +0·15 | 0·60 | 14th | 0 | – | 13 | 2·55 | +0·40 | 0·58 | 7th | 0 | – | |
| Jersey | 36 11 | 39 | 11 | 1·64 | −0·25 | 0·57 | 20th | 0 | – | 18 | 3·27 | +1·30 | 0·69 | 17th | 0 | – | 15 | 2·08 | +0·65 | 0·49 | 6th | 0 | – | |
| Rugby | 3 0 | 383 | 14 | 2·51 | +1·05 | 0·69 | 27th | 0 | – | 18 | 2·18 | +0·59 | 0·41 | 8th | 0 | – | 18 | 4·30 | +1·64 | 0·76 | 18th | 0 | – | |
| Sandwick | 2 0 | 78 | 20 | 2·40 | −0·18 | 0·36 | 7th | 0 | – | 19 | 1·69 | −0·19 | 0·26 | 19th | 0 | – | 18 | 3·52 | +1·62 | 0·86 | 28th | 0 | – | |

# PART 3.

The month of July commenced with damp weather and south-westerly winds, which, though light generally, blew strongly at Valencia during the 1st. On the 2nd an improvement commenced, and uniformly high pressures gradually became prevalent over the north-west of Europe. Fine weather was general and temperature high until the 5th; but at about 4 p.m. on the 4th a very sudden fall of the thermometer took place at Aberdeen, accompanied by the *veering* of the wind from S. to N. and N.E., but apparently without either rain or a thunderstorm.

July 5. The barometer began to fall, the change commencing on our western coasts and subsequently extending over the rest of the country. Hot, sultry weather set in. At Harpenden (Herts) an extraordinary duststorm occurred at 2.30 p.m., 6th, preceding a thunderstorm, with a little rain, which travelled from the south-eastward. During the day rain set in more generally, and between this day and the 7th a shallow depression crossed the southern parts of our islands in an easterly direction, accompanied by very severe thunderstorms, and some rain in the north also. The changes of temperature were, locally, *very* sudden, and the falls of rain heavy, exceeding two inches at many of Mr. Symons' stations in the south and west of Great Britain. (*See* Plate XXXVIII.) On the 7th a very destructive whirlwind of small diameter passed through Herefordshire, near Ross.

At 8 a.m. on the 8th the depression was passing off to the northward, and the northerly wind in its rear reduced the temperature very much over the whole country. It was also accompanied by rain in the north and north-west during the day.

In the early hours of July 10th pressure was again giving way in Ireland, and for a time the southerly current was restored, blowing very freshly at the most western stations, with a renewal of the wet weather, while in the eastern parts of the country the sky cleared. The southerly winds soon extended. On the continent the weather remained fine and bright, but in the British Islands it became generally dull, sultry, and wet.

At 8 a.m. on the 12th a slight depression appeared off the south coast of Ireland, in addition to which a second—but very shallow one—lay over the eastern counties of England, its centre being near Cambridge. A moderate to fresh south-easterly breeze prevailed on our south-western coasts, while to the eastward thunderstorms and variable breezes had been general since the previous evening. On the following day (13th) the wind again veered to N. in the west, but clouds, showers, and thunderstorms were very general till the 16th. It is worth noting how very slight the changes of pressure were during the whole month, notwithstanding the serious electrical disturbances which occurred.

After the 16th the Norwegian pressures gave way, and the weather improved in the United Kingdom. At 8 a.m., 17th, a definite depression was found over the south of

Scandinavia, Fig. 41, Plate XL., but the disturbed weather resulting from it seems only to have just touched our north-eastern stations. On the 20th (when the barometer had become highest over Germany, Belgium, and our south-eastern stations) the sky cleared very much in the south-east of England, and very hot weather set in, though southerly winds and rain prevailed in the north. The warm weather became more general, but on the 21st thunderstorms again visited our most northern coasts, and on the 22nd became more general in the east and south-east. The peculiarly sudden changes of temperature and wind which accompany these storms are to be seen in several parts of Plates XLI. and XLII., notably at Kew on the 22nd and 25th, and Stonyhurst on the 26th and 29th. The 25th was exceptionally stormy even in the midst of an unusually disturbed period, and from nearly all parts of our islands more or less of the electrical phenomena were reported. The maximum temperature for the year was attained at Kew on this day. On the 26th southerly winds were again established in the west —forming the eastern side of a depression advancing from the westward (*see* Fig. 42, Plate XLII.)—but after prevailing for two days they gave way to northerly breezes as the western barometers rose, and the depression passed over to Denmark. The month closed with finer and *comparatively* cool weather.

The weather was generally calm during the first few days of August until the 5th, when a small depression passed over the south of England, causing a fresh gale from W. at Falmouth at 3 p.m., which was also felt at a few other stations. This change had been preceded by an aurora in the north. Another, somewhat similar, wind-system crossed our islands on the 7th, accompanied by several thunderstorms (the rainfall at Portishead amounting to 1·86 ins. on this day), and was followed by northerly winds on the 8th. Brilliant aurora was observed in the north and west in the evening.

August 9. The appearance of a southerly wind and a briskly falling barometer at Valencia at 8 a.m. indicated the approach of a more serious disturbance, and a strong breeze from E. by S. began at that station at 9 a.m. The wind never reached the force of a strong gale, and it was only felt at four of our stations.

| Observatories. Aug. 9th-10th. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 9 a.m. (9th). | E. by S. | midnt. (9th). | S.S.E. | 42 | 4 | 5 a.m. (10th) | W.S.W. | 20 | 3 a.m. (10th). | S. by E. | 44 | — |
| Sandwick | 8 a.m. (10th). | E.S.E. | — | — | — | — | 2 p.m. (10th) | S.E. by E. | 6 | 10 a.m. (10th). | E. by S. | 34 | — |
| Falmouth | 3 p.m. (9th). | S. by E. | — | — | — | — | 8 p.m (9th) | S. by W. | 5 | 4 p.m. (9th). | S. by E. | 36 | — |
| Falmouth | 9 a.m. (10th). | S.W. by S. | — | — | — | — | 3 p.m. (10th) | W. by S. | 6 | 11 a.m. & 2 p.m. (10th) | S.W. | 36 | — |
| Holyhead | 9 p.m. (9th). | S.E. | — | — | — | — | 3 p.m. (10th) | S.W. by S. | 18 | 8 a.m. (10th). | S.S.E. | 36 | — |

Fig. 43 (Plate XLV.) shows the conditions of pressure at 8 a.m. on the 10th, when the centre of depression lay over the south of Ireland. Its track was in a north-easterly direction, as we gather from Fig. 44 that by 8 a.m. on the 11th the curve of lowest readings embraced the north-east of Scotland, while fresh westerly winds were blowing in the south of England and in France. At Falmouth, in fact, a strong breeze was felt on both the 10th and 11th. This disturbance was succeeded by calm and fine weather for a day or two, the 14th being the only day during the month on which no rain was reported from any of our stations. In the course of the evening aurora again appeared in the north.

August 15. A steady diminution of pressure in the west, while the barograms at the English observatories showed remarkable steadiness (Plate XLVI.), had the tendency to produce rather steep gradients for southerly winds over Ireland, and accordingly we see that at Valencia the wind rose to a strong breeze in the course of the day and increased to a gale in the afternoon of the next day. This breeze never attained serious proportions, as is proved by the subjoined table, and the whole disturbance passed off to the northward and disappeared.

| Observatories. Aug. 16th. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 8 a.m. (15th). | S.E. by E. | 11 a.m. (16th). | S.S.E. | 46 | 11 | midnt. (16th) | S. | 40 | 6 p.m. (16th). | S.S.E. | 50 | — |
| Sandwick - | 9 a.m. (16th). | S.E. by S. | 3 p.m. (16th). | S.S.E. | 41 | 4 | 7 a.m. (17th) | S. | 22 | 4 p.m. (16th). | S.S.E. | 42 | — |
| Holyhead - | 3 a.m. (16th). | S. by E. | 11 a.m. (16th). | S.S.E. | 41 | 3 | noon (17th) | S. by E. | 33 | 2 p.m. (16th). | S. by E. | 43 | — |

The remarkable reduction of diurnal range in all the thermograms, except that for Kew, during the 15th and 16th, caused by the large amount of cloud and mist which was prevalent, seems worthy of notice. The sky cleared in the south of England on the 18th and three very fine days ensued, but on the 21st the rain and cloud returned and continued with but little intermission until the end of the month.

Aurora was again visible on the evening of the 25th, and, as usual, a barometrical depression passed over these islands, but without giving rise to a gale.

Thunderstorms were very prevalent during the early part of the month, though not quite to so great an extent as in the preceding months.

Sept. 1. The barometer fell briskly at Valencia in the morning, and the wind veered to S. and rose to a stiff breeze. This was caused by a depression which appears to have lain off the west coast of Ireland for several days, the mercury not

rising definitely at Valencia until the 5th. During this period the minor irregularities of the barograms were very striking at all the observatories except Valencia (Plate L). The curves for Stonyhurst and Kew, both of them, show a sudden temporary rise of pressure with a shower of rain on the morning of the 4th, but we can hardly trace a definite connexion between these two disturbances.

Thunderstorms were extremely prevalent, and more than an inch of rain fell on the Welsh coast on the 1st and 5th. The rain record for Glasgow (Plate L.) will sufficiently indicate the character of the weather.

A slight further depression is noticeable at Valencia at 10 p.m. on the 4th, which propagated itself to Falmouth by noon next day, and as at the same time the mercury was rising steadily at Kew, the gradients for southerly winds were increased over the south of England, and a moderate S.E. gale blew at Falmouth, Holyhead, and Pembroke in the afternoon.

Sept. 9. A depression passed over all our stations and was most marked at Stonyhurst, where the rain was heaviest. It did not cause any serious wind, and was accompanied by an aurora in the west and north in the evening.

By next morning it had advanced to Norway, its centre lying near Skudesnaes.

For the next week the changes were quite unimportant, but on the 17th an extensive depression appeared in Scotland and swept across the northern stations, the barograms in the south being almost entirely unaffected by it. It caused nothing but a fresh breeze anywhere except on the Danish coast, where a westerly gale was blowing on the morning of the 19th. Aurora had again been reported on the preceding night. It caused a serious reduction of temperature, the five-day mean for Sept. 18–22 being less than the preceding mean, to the extent of nearly 10°, on the average of all the observatories.

The wind subsequently drew to N., blowing stiffly at Holyhead all day long on the 21st, and continued so until the 23rd, on which day, as we see from Plate LIV., the barometer began to give way, both at Valencia and Glasgow. The latter oscillation was very local, and does not appear at any other observatory, but it drew the winds into N. and N.E. at all the north-western stations by 2 p.m. Meanwhile the fall in the west continued, and by 8 a.m. on the 24th we see that the minimum pressure had been registered at all except the Scotch observatories and Kew. At this time an oval area, with readings below 29·4 ins., stretched from Scarborough to Skudesnaes, and the wind was blowing freshly from N.N.W. on our west coasts; a gale being reported by the telegraphic observers at Greencastle and Valencia, though the anemogram hardly shows it at the latter station, the observatory being sheltered by a hill on the north-west side.

A brisk recovery set in on the west coast in the afternoon of the 24th, which caused the northerly winds to extend to England, and produced a gale at Holyhead which lasted for 36 hours, and at the same time a slight rise of the barometer is observable

in the reports from the west of Norway, so that the depression which is noticeable at Aberdeen appears to have advanced upon Scotland from the northward. Unfortunately the failure of the entire records for Glasgow precludes our tracing its effects on that station.

Sept. 25. We see from Fig. 45 that the lowest readings are to be found over the North Sea, while the cyclonic circulation of the wind is nearly complete, and gales are reported from the coasts of Germany and Denmark, as well as from the Moray Firth, from Holyhead, and Alnwick Castle. The rainfall was locally very heavy during the 24th and 25th, the telegraphic reporter at Aberdeen collecting 1·20 ins. on the former and as much as 2·01 ins. on the latter day. At the observatory, however, the fall was not quite so great, and it will be seen from Plate LIV. that it occurred mainly on the 25th, on which day the observer at Scarborough also reported 1·37 ins.

A steady general rise took place everywhere up to the morning of the 26th, when, as we see from Fig. 46, the centre of the storm lay near Heligoland, and a hard S.W. gale was blowing at Hamburg. At the same time, however, a fresh and important decrease had set in at Valencia, where the wind rose to a gale by midnight. The most serious fall of the mercury, both as to rapidity and irregularity, was at Armagh, and so we find that by 8 a.m. on the 27th, Fig. 47, the curve of 29·5 skirts the west of Scotland, and a general S.W. gale is blowing over the south-west of England, which extended to the Channel by noon. The particulars will be found in the following table. Nothing beyond a fresh breeze was reported from Sandwick in the Orkneys.

| Observatories. Sept. 26th–29th. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 5 p.m. (26th). | S. | midnt. (26th). | S. by W. | 44 | 9 | 5 p.m. (27th) | W.S.W. | 24 | 2 a.m. (27th). | S. by W. | 46 | — |
| Glasgow | 8 a.m. (28th). | S.W. | 1 p.m. (28th). | S.W. by W. | 43 | 3 | 4 p.m. (28th) | W. by S. | 8 | 2 p.m. (28th). | S.W. by W. | 46 | — |
| Falmouth | 3 a.m. (27th). | S.W. by W. | 9 a.m. (27th). | S.W. | 41 | 14 | 8 a.m. (28th) | W. | 29 | 5 p.m. (27th). | S.W. by S. | 43 | — |
| Holyhead | 11 a.m. (27th). | S.S.W. | noon (27th). | S.S.W. | 45 | 6 | 2 a.m. (29th) | W. by S. | 39 | 3 p.m. (27th.) | S.S.W. | 50 | — |
| | | | 7 a.m. (28th). | S.W. | 45 | 11 | | | | noon (28th). | S.W. | 52 | — |
| Stonyhurst | noon (28th). | W.S.W. | — | — | — | — | 6 p.m. (28th) | W.S.W. | 6 | 2 p.m. (28th). | W.S.W. | 37 | — |
| Halifax (Moorside) | 1 p.m. (28th). | W.S.W. | — | — | — | — | 1 a.m. (29th) | W. by N. | 12 | 4 p.m. (28th). | W. by S. | 40 | — |
| Alnwick Castle | 2 p.m. (27th). | S.W. by W. | 3 a.m. (28th). | W. | 45 | 16 | 10 p.m. (28th) | W. by N. | 32 | 4 p.m. (28th). | W.S.W. | 50 | — |

Fig. 48 shows us the condition of affairs at 6 p.m., when the minimum had passed Glasgow and Aberdeen, and the centre of the storm lay near the Pentland Firth. The

S.W. gale reported from Sumburgh Head, and shown on the diagram, is probably incorrect.

The recovery in Scotland from this depression was insignificant, and by next morning a fresh decrease had appeared there which was scarcely traceable in Ireland. This was produced by a more extensive disturbance of which the centre passed near the Shetlands. The total difference of pressure shown on Fig. 49, Plate LV., for 8 a.m. on the 28th was 1·64 ins. between Lyons and Sumburgh Head, and was very evenly distributed, giving a general gradient of about ·08 in. per 50 miles over the whole distance. The S.W. gales still continued at several stations.

By next morning, the 29th, the whole disturbance had passed off to Norway (Fig. 50) where westerly gales were reported, and the weather cleared up in these islands for a brief space. Before the end of the month the approach of a fresh storm was indicated.

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## Remarks.

The following table gives the number of hours during which the wind reached the velocity of 30 miles or upwards per hour, irrespective of its direction, for each month and for the entire quarter.

| Stations. | July. | Aug. | Sept. | Total. | Stations. | July. | Aug. | Sept. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| Valencia - - | 111 | 74 | 104 | 289 | Holyhead - | 57 | 104 | 248 | 409 |
| Armagh - - | 0 | 0 | 0 | 0 | Stonyhurst - | 0 | 0 | 12 | 12 |
| Glasgow - - | 5 | 0 | 13 | 18 | Halifax - - | 0 | 0 | 24 | 24 |
| Aberdeen - - | 0 | 1 | 9 | 10 | Alnwick Castle - | 0 | 15 | 107 | 122 |
| Sandwick - - | 23 | 29 | *71 ? | 123 ? | Kew - - - | 0 | 1 | 6 | 7 |
| Falmouth - - | 8 | 48 | 62 | 118 | Yarmouth - - | 12 | 13 | 19 | 44 |

* Doubtful, as the instrument was out of action on the 11th and 20th.

It will be seen from this that the amount of strong winds experienced at Holyhead was excessive, and on the whole the table shows a very unequal distribution of the wind's force. While it was almost absolutely calm at Armagh, Glasgow, and Aberdeen, as well as at Stonyhurst, Halifax, and Kew, and even at Yarmouth, there was a fair proportion of wind at Sandwick, but the figure for Alnwick Castle is exceptionally high, and is attributable to the fact that in several cases during the month the storms after crossing these islands attained greater force over the North Sea than they had exhibited on our western coasts.

*Pressure.*— July.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| Valencia - - | 29·877 | −0·139 | 30·203 | 4th, noon | 29·512 | 26th, 4 p.m. | 0·691 |
| Armagh - - | 29·924 | +0·009 | 30·194 | 4th, 1 p.m. | 29·660 | 10th, 7 p.m. | 0·534 |
| Glasgow - - | 29·922 | +0·050 | 30·168 | 4th, noon | 29·651 | 8th, 4 p.m. | 0·517 |
| Aberdeen - - | 29·944 | +0·066 | 30·183 | 25th, 8 p.m. | 29·582 | 9th, 1 a.m. | 0·601 |
| Falmouth - - | 29·951 | −0·097 | 30·331 | 4th, noon | 29·662 | 30th, 3 a.m. | 0·669 |
| Stonyhurst - - | 29·928 | +0·018 | 30·245 | 4th, 11 a.m. | 29·699 | 8th, 10 a.m. | 0·546 |
| Kew - - - | 29·940 | −0·044 | 30·257 | 4th, 7 a.m. | 29·659 | 30th, 6 a.m. | 0·598 |

Pressure was very near its average value throughout the month, being rather above it in Scotland and below it in the south and west. The greatest difference did not amount to 0·14 in. The range was less than in any month during the last four years, the maximum recorded being only 0·691 in., at Valencia.

August.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| Valencia - - | 29·962 | −0·002 | 30·377 | 27th, 9 p.m. | 29·229 | 10th, 4 a.m. | 1·148 |
| Armagh - - | 29·955 | +0·091 | 30·363 | 27th, 8 p.m. | 29·370 | 10th, noon | 0·993 |
| Glasgow - - | 29·933 | +0·116 | 30·282 | 14th, 8 a.m. | 29·410 | 10th, 5 p.m. | 0·872 |
| Aberdeen - - | 29·963 | +0·139 | 30·327 | 18th, 4 p.m. | 29·429 | 11th, 6 a.m. | 0·898 |
| Falmouth - - | 30·005 | −0·010 | 30·374 | 27th, 10 p.m. | 29·466 | 5th, 2 p.m. | 0·908 |
| Stonyhurst - - | 29·956 | +0·071 | 30·326 | 27th, 11 p.m. | 29·380 | 10th, 6 p.m. | 0·946 |
| Kew - - - | 29·984 | +0·028 | 30·344 | 28th, 7 a.m. | 29·478 | 5th, 7 p.m. | 0·866 |

The means at the Scotch observatories still show the greatest excess of pressure, as is also indicated by the comparative frequency of easterly winds during the month. The range was still moderate, exceeding an inch only at Valencia. The minima were registered on the 10th or 11th at all the observatories except those in the south of England.

September.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| Valencia - - | 29·851 | +0·016 | 30·345 | 13th, 7 p.m. | 29·154 | 4th, 10 p.m. | 1·191 |
| Armagh - - | 29·770 | −0·081 | 30·231 | 14th, 11 a.m. | 29·273 | 28th, 10 a.m. | 0·958 |
| Glasgow - - | 29·694 | −0·108 | 30·161 | 14th, 10 a.m. | 29·024 | 28th, 3 p.m. | 1·137 |
| Aberdeen - - | 29·652 | −0·160 | 30·128 | 14th, 10 a.m. | 28·876 | 28th, 3 p.m. | 1·252 |
| Falmouth - - | 29·913 | −0·097 | 30·418 | 13th, 10 a.m. | 29·408 | 24th, 8 a.m. | 1·010 |
| Stonyhurst - - | 29·755 | −0·151 | 30·258 | 13th, 10 a.m. | 29·321 | 28th, 2 p.m. | 0·937 |
| Kew - - - | 29·864 | −0·110 | 30·334 | 13th, 10 a.m. | 29·378 | 24th, 1 p.m. | 0·956 |

In this month all the means except that for Valencia fell below the average, the deficiency being greatest at Aberdeen, while Armagh and Falmouth, when compared with the other observatories, show a progressive change towards the condition of slight

excess shown at Valencia. The range was not very great, only amounting to 1·252 in. at Aberdeen, where it was highest.

*Temperature.*— July.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 59·7 | −0·3 | 69·7 | 24th, 6 p.m. | 48·6 | 7th, 2 a.m. | 21·1 |
| Armagh - - | 60·0 | −0·4 | 73·6 | 20th, 2 p.m. | 45·7 | 17th, 5 a.m. | 27·9 |
| Glasgow - - | 59·3 | +2·5 | 75·1 | 28th, 4 p.m. | 44·7 | 10th, 5 a.m. | 30·4 |
| Aberdeen - - | 57·5 | +1·6 | 74·5 | 4th, 1 p.m.<br>5th, 10 a.m. | 44·7 | 17th, 4 a.m. | 29·8 |
| Falmouth - - | 61·5 | — | 71·4 | 21st, 2 p.m. | 54·2 | 8th, 5 a.m. | 17·2 |
| Stonyhurst - | 61·5 | +3·7 | 81·7 | 21st, 4 p.m. | 43·7 | 31st, 4 a.m. | 38·0 |
| Kew - - - | 65·1 | +3·3 | 88·6 | 25th, 3 p.m. | 47·5 | 31st, 5 a.m. | 41·1 |

Temperature was nearly at its average value; Stonyhurst and Kew, however, show a monthly temperature more than 3° above the mean. The range was least at Falmouth, owing to the high minimum temperature recorded, and greatest at Kew, where the very high temperature of 88°·6 was registered on the 25th.

August.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 59·6 | +0·7 | 75·5 | 19th, noon | 47·8 | 13th, 5 a.m. | 27·7 |
| Armagh - - | 58·0 | −0·9 | 71·5 | 22nd, 3 p.m. | *47·2 | 2nd, 6 a.m. | 24·3 |
| Glasgow - - | 56·4 | −0·7 | 73·1 | 19th, 4 p.m. | 43·0 | 14th, 4 a.m. | 30·1 |
| Aberdeen - - | 55·0 | −1·0 | 65·8 | 19th, 2 p.m. | 40·3 | 5th, 5 a.m. | 25·5 |
| Falmouth - - | 60·7 | — | 71·0 | 21st, noon | 51·0 | 13th, 4 a.m. | 20·0 |
| Stonyhurst - | 58·4 | +1·2 | 77·8 | 18th, 3 p.m. | *48·4 | 6th, 2 a.m. | 29·4 |
| Kew - - - | 60·9 | −0·2 | 81·1 | 17th, 3 p.m. | 45·8 | 28th, 5 a.m. | 35·3 |

* These values differ from those given in Table I. App. I., which is compiled for astronomical time.

In August, too, we have no great variation of mean temperature from its average value to record, the greatest difference either way hardly exceeding a degree. The range is, as before, highest at Kew and lowest at Falmouth, and is generally rather small for the time of year.

September.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 57·2 | +0·8 | 68·0 | 5th, 5 p.m. | 44·0 | 25th, 6 a.m. | 24·0 |
| Armagh - - | 53·6 | −1·6 | 72·5 | 13th, 2 p.m. | 39·0 | 26th, 6 a.m. | 33·5 |
| Glasgow - - | 51·6 | −1·7 | 65·2 | 4th, 3 p.m. | 36·0 | 22nd, 3 a.m. | 29·2 |
| Aberdeen - - | 51·0 | −1·6 | 66·7 | 12th, 3 p.m. | 36·1 | 23rd, 1 a.m. | 30·6 |
| Falmouth - - | 57·8 | — | 68·9 | 15th, 11 a.m. | 43·7 | 23rd, 7 a.m. | 25·2 |
| Stonyhurst - - | 54·5 | +0·6 | 71·4 | 4th, 3 p.m. | 36·1 | 22nd, 6 a.m. | 35·3 |
| Kew - - - | 57·6 | +1·1 | 81·1 | 3rd, 3 p.m. | 36·4 | 22nd, 6 a.m. | 44·7 |

September was rather a cold month in Scotland and the north of Ireland. The maxima registered occurred on various days, and the figure for Armagh is above that for the same observatory for August. At Kew the readings are the same in the two months. All the minima fell within four days of each other, viz., between the 22nd and 26th. The absolute range was, as usual, greatest at Kew, and it was least at Valencia.

The difference between the five-day mean temperatures at Kew, and the Greenwich 43 years' averages is given below.

| Date. | Variation. | Date. | Variation. | Date. | Variation. |
|---|---|---|---|---|---|
| | ° | | ° | | ° |
| June 30–July 4 | +2·3 | July 30–Aug. 3 | −3·7 | Aug. 29–Sept. 2 | +1·1 |
| July 5– 9 - | +3·5 | Aug. 4– 8 - | −2·0 | Sept. 3– 7 - | +7·0 |
| „ 10–14 - | +0·5 | „ 9–13 - | −2·4 | „ 8–12 - | +5·4 |
| „ 15–19 - | −0·6 | „ 14–18 - | +1·9 | „ 13–17 - | +4·7 |
| „ 20–24 - | +9·0 | „ 19–23 - | +4·1 | „ 18–22 - | −7·4 |
| „ 25–29 - | +7·3 | „ 24–28 - | +0·8 | „ 23–27 - | −3·9 |

The changes of temperature were accordingly rather irregular, the days from July 20–29 being very warm, as well as the first half of September, while the end of the latter month was cold, the difference between the respective deviations from the mean of the 13th–17th and the 18th–22nd being as much as 12°·1, while the actual fall of temperature was 13°.

## RAIN.

The rainfall for the quarter was above the average at every station, but there was some variation in the different months.

Thus in July the whole of Ireland except the south coasts shows a deficiency, which at Dublin amounts to half the mean amount.

In August a slight defect in amount is observable at all the stations on the south coasts, as well as at Nairn and Thurso.

In September the south of England again enjoyed comparatively fine weather, while in the north the amount of rain recorded was excessive, exceeding 8 inches at Stonyhurst and at Greencastle. At no less than 10 stations did the fall exceed 6 inches. At Glasgow, Aberdeen, Leith, Scarborough, and Greencastle the fall was double the average fall for the month.

At Florence Court and Greencastle the number of rainless days during the month was only one, at Stonyhurst two, and at Thurso and Pembroke three.

Falls exceeding an inch were not uncommon in July and September.

# RAINFALL, 1872.

| Positions of Gauges. | | | July. | | | | | | | August. | | | | | | | September. | | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Names of Stations. | Height of Gauge. Above Ground. | Height of Gauge. Above Mean Sea Level. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Days. | |
| **Observatories.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Valencia | ft. in. 2 0 | ft. 11 | 20 | 5·58 | +2·91 | 0·80 | 1st | 0 | — | 16 | 4·50 | −0·06 | 0·90 | 17th | 0 | — | 24 | 4·78 | −0·37 | 0·72 | 4th | 0 | — | 66 - 14·86 |
| Armagh | 2 2 | 204 | 10 | 2·17 | −0·35 | 1·13 | 24th | 1 | 24th | 16 | 2·96 | −0·01 | 0·79 | 31st | 0 | — | 24 | 3·71 | +1·37 | 0·42 | 13th | 0 | — | 50 - 8·84 |
| Glasgow | 1 10 | 180 | 15 | 6·29 | +3·14 | 2·13 | 8th | 2 | 8th & 27th. | 22 | 4·56 | +0·32 | 0·66 | 8th | 0 | — | 25 | 7·18 | +3·55 | 1·54 | 5th | 1 | 5th | 62 - 18·03 |
| Aberdeen | 2 0 | 48 | 12 | 1·92 | −0·29 | 0·73 | 8th | 0 | — | 14 | 3·10 | +0·12 | 0·56 | 17th | 0 | — | 21 | 6·13 | +3·73 | 1·87 | 26th | 1 | 26th | 47 - 11·15 |
| Falmouth | 1 10 | 167 | 18 | 2·69 | +0·05 | 1·14 | 7th | 1 | 7th | 14 | 2·32 | −0·47 | 0·56 | 5th | 0 | — | 22 | 2·97 | −0·19 | 1·10 | 24th | 1 | 24th | 51 - 7·98 |
| Stonyhurst | 1 9 | 377 | 20 | 4·32 | +0·46 | 0·92 | 24th | 0 | — | 22 | 5·26 | +0·64 | 1·10 | 11th | 1 | 11th | 28 | 8·58 | +4·19 | 1·49 | 2nd | 1 | 2nd | 76 - 18·16 |
| Kew | 1 10 | 20 | 14 | 1·97 | +0·14 | 0·36 | 27th | 0 | — | 11 | 1·29 | −0·91 | 0·42 | 26th | 0 | — | 12 | 1·29 | −1·34 | 0·34 | 25th | 0 | — | 37 - 6·55 |
| **Telegraphic Reporting Stations.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Shetland (Sumburgh Head) | 1 9 | 170 | 8 | 1·81 | +0·46 | 0·67 | 1st | 0 | — | 12 | 4·24 | +1·84 | 0·95 | 29th | 0 | — | 22 | 4·00 | +1·74 | 1·20 | 27th | 1 | 27th | 42 |
| Thurso | 1 9 | 25 | 19 | 3·19 | +1·88 | 0·54 | 22nd | 0 | — | 17 | 2·51 | −0·29 | 0·36 | 27th | 0 | — | 27 | 3·68 | +0·40 | 0·33 | 3rd & 21st. | 0 | — | 63 |
| Wick | 1 9 | 100 | 17 | 2·40 | +1·02 | 0·44 | 8th | 0 | — | 13 | 2·72 | +0·40 | 0·90 | 11th | 0 | — | 18 | 2·74 | +0·36 | 0·38 | 3rd | 0 | — | 48 |
| Nairn | 1 2 | 44 | 16 | 2·94 | +1·43 | 0·62 | 7th | 0 | — | 18 | 2·73 | −0·12 | 0·83 | 10th | 0 | — | 25 | 3·42 | +0·77 | 0·42 | 3rd | 0 | — | 59 |
| Leith | 1 2 | 21 | 12 | 3·23 | +1·27 | 0·83 | 26th | 0 | — | 17 | 3·42 | +1·39 | 0·64 | 16th | 0 | — | 18 | 5·03 | +2·60 | 0·98 | 7th | 0 | — | 47 |
| North Shields | 10 0 | 107 | 18 | 1·85 | +0·04 | 0·40 | 26th | 0 | — | 18 | 3·17 | +0·73 | 0·58 | 12th | 0 | — | 16 | 3·94 | +1·70 | 0·90 | 23rd | 0 | — | 54 |
| Scarborough | 1 0 | 130 | 13 | 3·69 | +1·28 | 1·01 | 13th | 1 | 13th | 15 | 2·95 | +0·11 | 0·47 | 22nd | 0 | — | 20 | 6·12 | +3·75 | 1·37 | 25th | 2 | 24th & 25th. | 48 |
| Yarmouth | 5 2 | 24 | 12 | 3·72 | +1·86 | 0·81 | 11th | 0 | — | 11 | 3·28 | +1·34 | 0·64 | 26th | 0 | — | 15 | 2·88 | +0·20 | 0·68 | 25th | 0 | — | 38 |
| Ardrossan | 1 2 | 13 | 14 | 3·76 | +1·33 | 0·83 | 25th | 0 | — | 17 | 3·85 | +0·04 | 0·51 | 5th | 0 | — | 21 | 7·14 | +3·10 | 0·99 | 11th | 0 | — | 52 |
| Greenenstle | 7 6 | 70 | 10 | 2·26 | −0·36 | 1·02 | 25th | 1 | 25th | 15 | 4·51 | +1·22 | 0·85 | 5th | 0 | — | 29 | 8·74 | +5·39 | 0·99 | 11th | 0 | — | 54 |
| Holyhead | 9 0 | 24 | 11 | 2·98 | +2·02 | 1·12 | 7th | 1 | 7th | 13 | 2·53 | +0·46 | 0·46 | 29th | 0 | — | 21 | 6·29 | +2·62 | 1·43 | 1st | 2 | 1st & 5th. | 45 |
| Liverpool (Bidston Observatory) | 0 6 | 180 | 14 | 5·98 | +4·78 | 1·91 | 23rd | 1 | 23rd | 17 | 2·14 | 0·00 | 0·38 | 5th | 0 | — | 24 | 6·52 | +3·23 | 1·21 | 19th | 2 | 1st & 19th. | 55 |
| Roche's Point | 1 9 | 23 | 17 | 4·41 | +2·91 | 0·55 | 25th | 0 | — | 18 | 6·32 | +4·08 | 0·85 | 20th | 0 | — | 14 | 2·79 | −2·58 | 0·48 | 9th | 0 | — | 49 |
| Pembroke | 1 2 | 125 | 12 | 3·39 | +0·93 | 0·96 | 7th | 0 | — | 18 | 1·96 | −1·41 | 0·85 | 20th | 0 | — | 27 | 4·88 | −0·10 | 1·31 | 5th | 2 | 5th & 6th. | 57 |
| Scilly | 1 9 | 100 | 13 | 1·32 | — | 0·31 | 28th | 0 | — | 14 | 1·58 | — | 0·29 | 4th | 0 | — | 24 | 2·31 | — | 0·43 | 3rd | 0 | — | 67 |
| Plymouth | 27 0 | 95 | 13 | 2·42 | +0·53 | 1·35 | 6th | 1 | 6th | 9 | 1·40 | −1·10 | 0·33 | 2nd | 0 | — | 19 | 2·99 | −1·93 | 0·61 | 23rd | 0 | — | 41 |
| Portsmouth | 1 0 | 16 | 13 | 3·85 | +2·05 | 1·90 | 24th | 1 | 24th | 11 | 1·49 | −0·52 | 0·52 | 2nd | 0 | — | 16 | 2·00 | −1·40 | 0·61 | 24th | 0 | — | 40 |
| Dover | 23 0 | 46 | 15 | 3·19 | — | 0·80 | 23rd | 0 | — | 14 | 2·08 | — | 0·65 | 2nd | 0 | — | 12 | 1·49 | — | 0·75 | 24th | 0 | — | 41 |
| London | 1 2 | 73 | 13 | 2·37 | +0·60 | 0·77 | 23rd | 0 | — | 12 | 2·60 | +0·28 | 0·76 | 2nd | 0 | — | 13 | 1·45 | −1·16 | 0·32 | 24th | 0 | — | 38 |
| **Extra Stations.** (Information supplied by Societies, private individuals, and others.) | | | | | | | | | | | | | | | | | | | | | | | | |
| Barnstaple | 0 8 | 31 | 16 | 6·35 | +4·10 | 3·00 | 6th | 2 | 6th & 29th. | 14 | 2·82 | −0·18 | 0·62 | 1st | 0 | — | 25 | 5·14 | +1·10 | 0·92 | 23rd | 0 | — | 55 - 14·31 |
| Dublin | 3 0 | 57 | 12 | 1·10 | −1·28 | 0·35 | 25th | 0 | — | 17 | 4·30 | +1·76 | 0·99 | 5th | 0 | — | 22 | 2·46 | +0·14 | 0·49 | 9th | 0 | — | 57 - 7·86 |
| Florence Court (co. Fermanagh) | 13 0 | 300 | 11 | 1·74 | −1·24 | 0·49 | 12th | 0 | — | 18 | 6·51 | +2·93 | 1·90 | 5th | 1 | 5th | 29 | 6·63 | +3·25 | 1·02 | 3rd | 1 | 3rd | 58 - 14·88 |
| Galway | 8 2 | 30 | 15 | 2·80 | −0·53 | 1·22 | 26th | 1 | 26th | 15 | 5·25 | +1·27 | 1·03 | 14th | 1 | 14th | 20 | 6·90 | +2·27 | 1·03 | 5th | 1 | 5th | 50 - 14·95 |
| Guernsey | 12 0 | 204 | 11 | 4·44 | +2·86 | 1·41 | 24th | 1 | 24th | 11 | 2·19 | −0·20 | 1·12 | 21st | 1 | 21st | 18 | 2·14 | −1·45 | 0·35 | 28th | 0 | — | 40 - 8·77 |
| Helston | 5 0 | 115 | 15 | 3·39 | +0·91 | 1·30 | 7th | 1 | 7th | 12 | 2·21 | −0·52 | 0·80 | 7th | 0 | — | 20 | 2·94 | −0·21 | 0·98 | 24th | 0 | — | 47 - 8·54 |
| Jersey | 36 11 | 39 | 13 | 4·17 | +2·42 | 2·47 | 24th | 1 | 24th | 9 | 1·54 | −0·76 | 0·55 | 7th | 0 | — | 16 | 2·56 | −0·44 | 0·37 | 20th | 0 | — | 38 - 8·27 |
| Rugby | 3 0 | 383 | 15 | 4·34 | +2·30 | 0·95 | 26th | 0 | — | 14 | 2·99 | +0·38 | 1·28 | 8th | 1 | 8th | 19 | 1·61 | −1·19 | 0·33 | 1st & 27th. | 0 | — | 48 - 8·74 |
| Sandwick, Orkney Islands | 2 0 | 78 | 16 | 2·67 | +0·84 | 0·56 | 20th | 0 | — | 13 | 3·40 | +0·49 | 0·67 | 6th | 0 | — | 25 | 2·90 | −0·90 | 0·35 | 18th | 0 | — | 52 - 8·97 |

# PART 4.

THE fall of the barometer which had commenced in the west on the last day of September ushered in a series of slight disturbances which passed in a north-easterly direction along our western shores. The centre of the first of these lay, at 8 a.m. on the 1st, away to the westward or north-westward of Scotland, its influence having extended laterally over the whole of our islands during the preceding night. Moderate south-westerly breezes prevailed at most stations, drawing into S. on the Scotch coasts, and to E. in the Shetlands and west of Norway. At Alnwick Castle the velocity varied from 20 to 35 miles an hour from W.S.W. all the morning. The weather was mild and damp. During the day the barometer continued to fall fast, especially in the west, and the wind rose to a gale at the western stations.

| Observatories. Oct. 1, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 5 a.m. (1st). | S. | 1 p.m. (1st). | S.S.E. | 46 | 3 | 9 p.m. (1st) | S. by W. | 16 | 3 p.m. (1st). | S. by E. | 51 | Velocity unsettled, from 20 to 36 miles an hour till 3 p.m. 2nd. Wind S.S.W. |
| Holyhead - | 1 a.m. (1st). | S.S.W. | 3 p.m. (1st). | S. | 47 | 10 | 2 a.m. (2nd) | S. by W. | 25 | 7 p.m. & 9 p.m. (1st). | S. by E. | 49 | Wind above 30 miles, S.S.W. during greater part of 2nd. |

At 8 a.m. on the 2nd pressure was still lowest in the north-west, the difference between the readings at Toulon and Greencastle amounting to an inch. Temperature had risen except in Ireland. Fresh to strong southerly breezes were prevalent, and rain, which had been general, still fell in many parts of England. The rainfall during the 1st amounted to 1·40 ins. at Holyhead. Towards the latter part of the day a very brisk recovery of pressure set in at Valencia and extended quickly to our other western stations.

Oct. 3. At 8 a.m. the isobaric lines, which ran from Norway in a south-south-westerly direction towards our east coast, recurved there, and after running westwards over England took a north-north-westerly direction over Ireland. North-westerly breezes had set in at our western stations, while those from the southward were confined to central England and the shores of the North Sea. A further fall of rain occurred generally, and in the course of the day the north-westerly wind increased in strength for a short time, and thunderstorms occurred in several places. At night aurora was seen in Scotland.

Oct. 4. A further and very considerable rise of the barometer had occurred over the north-west of Europe, but a depression with steep gradients still lay off the Norwegian coast rather to the northward of lat. 60° N. This occasioned a fresh southerly gale at Skudesnaes at the same time that a N.W. gale was blowing at Sumburgh Head and in the Orkneys.

| Observatories. Oct. 3-4, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Aberdeen | 9 a.m. (4th). | W.N.W. | — | — | — | — | 4 p.m. (4th) | N.W.byW. | 7 | 10 a.m. (4th). | N.W.byW. | 39 | — |
| Sandwick | 10 a.m. (3rd). | W.byN. | 3 p.m. (3rd). | W. | 44 | 2 | 8 p.m. (4th) | N. by W. | 34 | 3 a.m. (4th). | W.N.W. | 63 | — |
| | | | 9 p.m. (3rd). | — | 50 | 19 | | | | | | | |
| Holyhead | 8 a.m. (3rd). | N.W. | — | — | — | — | 4 p.m. (3rd) | N.W.byW. | 8 | 9 a.m. (3rd). | N.W. | 43 | For one hour only. Wind again freshened during the afternoon of 4th to nearly 40 miles from the north-north-eastward. |

Over Great Britain, Ireland, and France readings were comparatively uniform, and owing to the formation of a small shallow depression near Pembroke light variable breezes prevailed. Temperature fell very generally, the change at our eastern stations varying from 10° to 16° in the 24 hours; the weather improved and the sea went down. During the day northerly breezes set in on our coasts, blowing strongly at Valencia and Scilly; and in the evening a velocity of 36 miles per hour from E.N.E. was recorded at Yarmouth. Lightning occurred at Roche's Point, Portsmouth, and Brighton, snow and hail fell in Caithness, and at night aurora was again seen in the north.

During the 5th and 6th barometrical readings were much more uniform. At first they were highest in the west and north-west of our islands, but gradually the highest readings passed eastwards, so that by 8 a.m. on the 6th a large anticyclone, whose maximum readings exceeded 30·3 ins., lay over England, the Channel, and the Netherlands. At this time northerly winds prevailed in France, but the southerly wind was again restored in the west and north of our islands, where it freshened considerably during the day. Variable airs occupied the space between these polar and tropical currents. Lightning was seen in the south-east of England, and aurora at Brighton on the 5th.

The western pressures had been giving way very slowly since midday of the 5th, and during the early morning of the 7th (when the zone of highest barometrical readings lay over Holland, the Channel, and the north of France) a small area of low pressure appeared off our north-west coasts, making the southerly wind general in the British Isles, and increasing its strength materially in the western counties. At

Holyhead a velocity of 47 miles an hour was reached at 4 a.m., and from 1 a.m. to 10 a.m. the speed exceeded 40 miles. Heavy rain set in, commencing in the W. and then extending over the whole country. At Broughton-in-Furness 3·03 ins. fell between the mornings of the 6th and 7th. In the south of France easterly winds prevailed, forming the northern part of an altogether distinct circulation.

For the next two days pressure gave way generally, accompanied by some minor oscillations, one of which is very clearly shown in the Valencia, Falmouth, and Stonyhurst barograms early on the 9th. Plate LVII. Aurora was seen at Sandwick on the 8th.

Oct. 9. At 8 a.m. barometrical readings varied from about 30·2 ins. at Corunna to 29·4 ins. in the north of Scotland. The slight disturbance to which the above-named oscillation seemed owing was lying between the Irish and Welsh coasts. Southerly winds were blowing in Great Britain (strongly at Pembroke), and west-north-westerly breezes in the south of Ireland, while over the Bay of Biscay variable breezes were reported. Very little change occurred till about midnight, except that the local depression passed over England to the North Sea, producing a great deal of rain along its track. A rapid fall of the mercury then set in at the Irish stations and extended quickly to England, but in the north of Scotland the change was scarcely felt.

Oct. 10. At 8 a.m. a very deep depression had advanced over Ireland from the westward. At Valencia the minimum pressure was already nearly reached, and though in *most* places gradients were not yet very steep, those between Scilly and the south of Ireland were 0·12 in. per 50 miles. A southerly gale had been blowing at Valencia during the morning, but the wind had veered to W. again, while in St. George's Channel it was rising rapidly from the southward, with rain. Hail fell at Markree in the morning. By 6 p.m. the centre of the disturbance was just passing Holyhead (Fig. 51, Plate LVII.), where, as will be seen by the following table, the changes of wind were exceedingly sudden.

| Observatories. Oct. 10-11, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 5 a.m. (10th). | S. by W. | 6 a.m. (10th). | S.S.W. | 45 | 3 | 4 p.m. (10th) | W. by N. | 11 | 8 a.m. (10th). | S.S.W. | 47 | Valencia is sheltered by high land to the northward and north-westward. |
| Falmouth | 11 a.m. (10th). | S.W. | 1 p.m. (10th). | S.W. to W. | 43 | 4 | 8 p.m. (10th) | W. by N. | 9 | 2 p.m. (10th). | S.W. | 46 | —— |
| Holyhead | 9 a.m. (10th). | S.S.E. | Noon (10th). | S.E. | 48 | 2 | 4 p.m. (10th) | S.W. by S. | 7 | Noon (10th). | S.E. | 52 | The velocity did not fall below 30 miles for the next two days, but the chief violence of the gale lasted only until early on the morning of the 11th. |
| | 7 p.m. (10th). | N.W. by N. | 7 p.m. (10th). | N.W. by N. | 47 | 27 | —— | — | — | 8 p.m. (10th). | N.W. by N. | 64 | |

The lull between the south-easterly and north-westerly portions of the gale at Holyhead was very marked, the velocity sinking to 16 miles an hour as the wind veered through S.W. and W., but at 7 p.m. the north-westerly gale burst suddenly on the place and blew with a velocity exceeding 60 miles an hour for several hours. In the meantime moderate southerly breezes were blowing in the east of England, strong westerly breezes in the Channel, and strong N.W. gales in Ireland; while in Scotland, where gradients were very slight, only variable airs were felt until the centre had passed more to the eastward. Rain fell everywhere, and at Dublin the clouds assumed a peculiar, festooned appearance, but no gale was felt there.

Oct. 11. By 8 a.m. the depression's centre was lying to the eastward of the English coast (Fig. 52), and while N. to N.W. winds were general over the United Kingdom and west of France, a strong southerly gale was blowing in Denmark, and fresh S.E. to E. winds in Norway. Temperature declined everywhere, showers of hail fell in several places, lightning was seen in the south of England, and a thunderstorm occurred in Liverpool, but the barometer rose briskly. The sky subsequently became clear, and the sea (which had been very high in the west) went down. During the day the N.W. breeze became strong in the north and north-east of our islands, and remained so for a day or so in most places. Very heavy rain fell at Aberdeen, thunderstorms occurred at Liverpool and Jersey, lightning at Portsmouth.

Oct. 12. The disturbance above noted still lay over the North Sea, having either halted in its journey, or moved a little to the northward of the position it occupied 24 hours previously. The barometer had risen not only in our islands and France, but also on the eastern shores of the North Sea, so that the disturbance was becoming filled up, for when its advance eastward was resumed on the following day readings in the south of Norway showed comparatively little reduction, and there is no record of pressure passing over that neighbourhood *nearly* so low as that experienced at Stonyhurst during the night of the 10th. The northerly wind had, however, blown hard at Aberdeen during the night (11th and 12th), and was yet fresh to strong at all the northern stations, with clouds and rain, while in the south it fell light and "backed" slightly, with fine weather, as will be seen by the diurnal range of temperature. Hail fell at Kew in the evening, and lightning was seen at Roche's Point. A solar halo was seen at Brighton about midday.

Oct. 13. The region of lowest pressure had again moved eastwards and was apparently not far from the mouth of the Skager Rack. A glance at the northern barograms for the afternoon of this day (Plate LVIII.) will show how the recovery of pressure became accelerated as the region of low pressure moved away. The wind (which was still northerly) now fell light at our northern stations, though a velocity of 30 miles from N.W. was reached at Holyhead at 10 a.m., and a feeble indraught of south-westerly wind on our south-east coasts brought a slight rise of temperature in that locality. The weather now improved considerably.

Oct. 14. All signs of the late disturbance had disappeared from our islands and their neighbourhood. The barometrical readings at 8 a.m. were remarkably uniform, and light variable breezes, chiefly from the north-westward, prevailed generally. Temperature had been very low in the night, except in the north-east, a sharp frost having occurred in the south-east of England. After noon the barometer began to fall slowly at all stations, but the Valencia records show some additional disturbance, which will be referred to further on.

Oct. 15. The conditions shown at 8 a.m. and the changes since the previous morning were very singular. Pressure was highest (about 30 ins.) in the north of Spain, and a wide band of uniform pressure, about 29·9 ins., stretched thence in a north-easterly direction across France, England, and the North Sea, to Norway. To the north-westward of this band readings decreased to 29·7 ins. in the north-west of Scotland, while to the south-eastward they decreased towards a depression which had formed over the north of Germany. Information from that locality is too scanty to ascertain the value of the lowest readings, but 29·59 ins. was registered at Cuxhaven, and 29·64 ins. at Brussels. Thus these two regions of deficient pressure were drawing air from the high pressure before mentioned, causing north-easterly to northerly winds on the Dutch coast and north-westerly in the south-east of England, while southerly breezes prevailed in the north-west of our islands. Readings consequently decreased steadily at all stations. In addition to the above disturbances a small local depression appeared over the south of Ireland, which had caused strong southerly winds there during the previous night, followed by a "backing" to N.W. and N. During the day this minor disturbance travelled slowly eastwards. Bright aurora was seen in Scotland at night, and great electrical disturbance was shown by the telegraphic apparatus at Roche's Point.

Oct. 16. The slight disturbance noticed yesterday now occupied a position somewhere over Berkshire and had become much more marked, while a second but less developed one, which had apparently also advanced from the westward, was found between the coasts of Scotland and Norway. Pressure was lower everywhere than on the previous morning, the change at Oxford amounting to 0·7 in. Fresh northerly breezes were felt on our western coasts (a velocity of 40 miles having been reached at Holyhead about 3 a.m.), north-westerly winds in the west of France, fresh southerly breezes in the south-east, and variable airs in Scotland, while in the south of Norway a south-easterly wind had set in which reached the force of a gale at Skudesnaes. Temperature fell both in Holland and the west of our islands. The weather was cloudy, wet, and unsettled, with hail at Valencia. During the day the English depression seems to have recoiled a little to the westward (Fig. 53, Plate LVIII.), and to have become still *more* marked, by the rising of the barometer on its north-western, western, and eastern borders, accompanied by a further fall in its centre. The northerly wind in the west

as well as the south-easterly breeze in the E. and N.E. rose to a gale, but in the south the wind fell light, owing to a reduction in the gradients caused by a giving way of pressure in France.

| Observatories. Oct. 16-17, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 1 a.m. (17th). | N. by W. | — | — | — | — | 8 a.m. (17th) | N. by E. | 7 | 5 a.m. (17th). | N. | 46 | For one hour only. |
| Holyhead | 1 a.m. (16th). | N. by E. | — | — | — | — | 8 a.m. (16th) | N. | 7 | 3 a.m. (16th). | N.N.W. | 40 | For one hour only. |
| Holyhead | 9 a.m. (16th). | N. by W. | 3 p.m. (16th). | N.E. by N. | 48 | 4 | 1 a.m. (17th) | E. by N. | 16 | 5 p.m. (16th). | N.N.E. | 54 | — |
| Yarmouth | 9 a.m. (16th). | S. | 11 a.m. (16th). | S.S.E. | 44 | 6 | 6 p.m. (16th) | S.S.E. | 9 | 1 p.m. (16th). | S.S.E. | 47 | Wind again freshened to above 30 miles between 4 p.m. and 7 p.m. 17th. |

Bright aurora was seen at Sumburgh Head in the evening, and hoar frost occurred in the south-east of England.

Oct. 17. The depression just referred to had become entirely broken up, and the barometer rose briskly at all but the French stations. A large shallow depression showed itself over the Bay of Biscay. The weather improved very much in the north-west. Light to moderate E. to N.E. breezes were felt in the United Kingdom, and southerly winds in the south of France, blowing strongly at Toulon. Considerable magnetic disturbance with an aurora was again observed in Scotland.

Oct. 18. The shallow disturbance mentioned yesterday advanced nearly to the mouth of the English Channel, but was evidently being filled up, for notwithstanding its advance towards us the barometer had risen everywhere. North-easterly breezes still prevailed in the west and north-west, but in the south-east of our islands the wind veered to S.E. and was light. Temperature had fallen in the north of Scotland, though it rose elsewhere. The weather was very cloudy generally, though clear for a time in some places, but magnetic disturbances continued at Aberdeen. Before noon the mercury began to fall fast in Ireland and a fresh disturbance approached us. A singular change is shown at Kew near 6 p.m., at Stonyhurst at midnight, at Glasgow and Armagh a few hours after (*see* Plate LIX.). With a shift of wind from E. to S. or S.W. temperature *fell suddenly* (and at Stonyhurst the fall continued till about 6 a.m. on the 19th, with the wind at S.S.W.), when a sudden "backing" to N.E. occurred, with no perceptible change. When, however, the wind *veered* slowly to S.E. again the thermometer rose briskly. It is to be noticed also that at Yarmouth the wind, which

freshened in the afternoon, rose to a velocity of 46 miles from E.S.E. at 7 p.m. for one hour only, a similar freshening to 30 miles occurring at Halifax three hours later.

Oct. 19. The mercury had descended about half an inch in the west of Ireland and 0·4 in. in Scotland since the previous morning, while over France, the south-eastern stations, and Denmark it had risen somewhat. A rather deep depression was advancing from the westward over the south of Ireland. Fresh to strong southerly breezes blew at Brest, drawing to S.E. in St. George's Channel, and reaching a velocity of 49 miles at Falmouth by 6 a.m., while light southerly winds blew in Great Britain generally, drawing to S.E. in the Shetlands. North-easterly winds prevailed in Norway, easterly in Denmark. Some rain had fallen generally and continued in France, but the weather was now fine in most parts of the United Kingdom. Thunder and lightning occurred at Pembroke in the afternoon.

Oct. 20. The depression noticed yesterday had entirely disappeared. The region of highest pressures (exceeding 29·9 ins.) lay over the Gulf of Finland, and a band in which readings were nearly 29·8 ins. stretched thence in a west-south-westerly direction right across the British Islands. To the northward of this band pressure decreased to 29·5 ins. at Thurso, and to the southward they decreased to 29·6 ins. at L'Orient, but thence an increase was noticeable towards the Mediterranean. Light easterly breezes prevailed on our southern coasts, light southerly airs in the north, and fresh S.E. to E. winds on the eastern shores of the North Sea. Temperature changed very irregularly; at Stonyhurst it fell to 35° in the shade at 7.30 a.m. The weather was very cloudy, though for a time it cleared in some places. Fog occurred in the south-east.

Oct. 21. The mercury had descended about two tenths of an inch in the south of England and over the North Sea, while on our extreme northern coasts, at Christiansund, and in the south of France, it rose a little. Two shallow depressions were formed, the one lying over the south-western counties of England, the other over Cambridge, Norfolk, and Suffolk, extending eastwards to the north-west part of Holland. Fresh to strong northerly winds swept along our western shores, blowing a stiff gale at Scilly and a strong breeze at Falmouth; and though the winds were light elsewhere, they circulated cyclonically round the regions of low pressure above mentioned. Temperature fell in the west and north, while the weather remained cloudy and showery generally. Near Shrewsbury the rainfall had been exceedingly heavy and continuous. In the afternoon the mercury began to fall at the Scotch observatories.

Oct. 22. The advent of a new centre of disturbance over the north-east of Scotland, which reduced pressure by about 0·4 in. in that region, was accompanied by a complete break up of the minor circulations noticed in the south yesterday; but by its extension

southwards any recovery of pressure at our south-eastern stations was at first prevented. North to N.W. winds now prevailed in the west, while fresh south-westerly breezes set in over the south-eastern stations, drawing into S.E. at the Danish and Norwegian ports. Very heavy rain accompanied this disturbance in Scotland, and a less quantity fell in all other parts of north-western Europe. During the morning the barometer began to rise on all but the northern coasts, to which, however, the change subsequently extended. A frost on the grass occurred in the south-east of England at night, with dense fog in some places.

Oct. 23. Pressure was still highest off the south-west coasts of our islands. The mercury stood higher at all stations than on the previous morning, and the depression then noticed had moved away to the north-north-westward. Temperature had fallen generally over England and France in the night—rapidly at our central stations; and while southerly breezes were reported on the Norwegian coasts and at Sumburgh Head, with westerly winds in Scotland, very variable airs and calms, with fine weather, but fog, occurred at our home stations, and light northerly breezes in France. Before noon, however, a very serious change had set in over the south of Ireland, the mercury descending rapidly, a southerly gale began and extended quickly to our other stations.

Oct. 24. At 8 a.m. the barometer had fallen upwards of 0·8 in. at Valencia, and to a less extent over the remainder of the north-west of Europe. Southerly winds set in generally, having blown a heavy gale in the south-west during the night, and temperature rose very rapidly. The S.S. "Plantagenet," Captain Campbell, experienced "violent S.W. gales" in St. George's Channel between 10 p.m. 23rd and 4 a.m. 24th. Rain fell except at the south-eastern and some of the central stations. The following table shows that though rather severe on our western coasts, the gale did not extend in any great force over the remainder of the kingdom, except in the English Channel.

| Observatories, Oct. 23–24, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 3 p.m. (23rd). | S.E. by S. | 7 p.m. (23rd). | S.S.E. | 48 | 3 | 10 p.m. (23rd) | S.W. | 7 | 8 p.m. (23rd). | S.S.E. | 50 | Wind again "backed" to S. by W. at 4 a.m. 24th, and freshened to over 30 miles for 2 hours. |
| Falmouth - | Midnt. (23rd). | S. by W. | — | — | — | — | 6 a.m. (24th) | W.S.W. | 6 | 4 a.m. (24th). | S. by W. | 43 | For 1 hour only. |
| Holyhead - | 6 p.m. (23rd). | S. by W. | 8 p.m. (23rd). | S. by E. | 50 | 10 | 7 a.m. (24th) | S. | 13 | 4 a.m. (24th). | S.S.E. | 58 | At 2 p.m. 23rd velocity rose to 33 miles from S.S.E. for 1 hour. |
| Yarmouth - | Noon (24th). | S. by W. | — | — | — | — | 2 a.m. (25th) | S. | 14 | 6 p.m. (24th). | S. by E. | 40 | For 1 hour only. |

At Stonyhurst and Sandwick also 30 miles an hour was slightly exceeded from S.S.E. and S.E. for a short time on the 24th. During the day the barometer continued to fall except in the north, and most rapidly in the south of Ireland, where the curve continued to descend very unsteadily till early next morning.

Oct. 25. Pressure at 8 a.m. varied from about 29·6 ins. in the south-west of France, Denmark, and the south of Norway, to 28·7 ins. at Valencia, where, however, a gradual recovery had been in progress since 3 a.m. A well-defined depression lay off the west coast of Ireland, but gradients not being very steep the wind was no longer very strong, except at Pembroke. Temperature had continued to rise in the north as well as at some of the French stations, but changed very little elsewhere. The weather was wet and unsettled. During the day the recovery in the south-west extended, being rapid in Ireland, but scarcely appreciable in the south-west of England.

Oct. 26. Owing to the sudden rise of the barometer in Ireland, while scarcely any change had occurred in the south-west of England, a new but not serious depression had been formed at the mouth of St. George's Channel, its steepest gradients being those on its south-eastern side. Thus while strong south-westerly breezes were blowing in the west of France and light S. to S.E. winds in Great Britain, light northerly winds had set in over the west and south of Ireland. Nevertheless temperature did not change much till later in the day, but the weather continued cloudy and showery, together with thunder and lightning in many parts of the country. During the day the depression disappeared entirely, having apparently become filled up. The recovery of pressure at Falmouth was very rapid. Heavy thunderstorms occurred at Yarmouth and near Folkestone at night, and a large quantity of rain fell on our south coast.

Oct. 27. The barometer had risen everywhere, and though, on the whole, lowest in the north-west and highest in France, gradients were very slight in the United Kingdom. Light south-westerly winds were general in our islands, and strong breezes from the same quarter in Belgium and the north of France, while south-easterly breezes were reported from Denmark and the Shetlands, blowing strongly at Sumburgh Head. The weather improved, but some showers fell in the west and north-west.

Oct. 28. A very peculiar change had taken place. In our islands the recovery of pressure above noticed had continued, especially on our south-west coasts; but over Belgium and central France a fall had taken place, resulting in the formation of a well-defined but very shallow area of low readings in the latter country. In the British Islands gradients were almost *nil*, so that calms or variable airs and fogs prevailed; but while fresh to strong northerly winds were blowing in the Bay of Biscay, a fresh southerly breeze was reported from Lyons, and a fresh to strong easterly breeze in the Straits of Dover. Temperature fell considerably in the United

Kingdom, with rain at our south-eastern stations and in France, which was very heavy at Rochefort. As the day advanced the depression appears to have moved south-eastwards. The barometer rose briskly at Rochefort, where the wind backed to W.N.W., but in the British Islands very little change occurred except at the most south-western stations. Slight aurora was seen in Scotland and the Orkney Islands.

Oct. 29. During the night time the barometer at our north-western stations had begun to fall slowly (Plate LXI.), while in the south and south-east it had risen, especially over central France. At 8 a.m. readings varied from about 30·4 ins. over the southern parts of the Bay of Biscay to 29·5 ins. at Thurso and Sumburgh Head, while apparently still lower readings lay to the north-westward of the Scotch coasts. Temperature had risen at all but the south-eastern and French stations, accompanied by fresh S.S.W. winds on our western coasts, while over France variable airs were reported, and an easterly breeze at Rochefort and Corunna. It is remarkable how suddenly this increase of temperature took place on the 28th at Valencia when compared with that at Armagh. During the day the barometric fall extended over the United Kingdom, while the south-westerly wind not only spread over the whole of western Europe, but rose, first to a moderate gale in the west, and afterwards to a fresh gale in the south. Rain fell everywhere—heavily in the west—a thunderstorm occurred at Leith, lightning at Ardrossan, and aurora was seen at Sandwick.

Oct. 30. At 8 a.m. the centre of a depression whose influence was felt over almost all the west of Europe, was passing east-north-eastwards some distance to the northward of Scotland, where the mercury had fallen rapidly since noon of the 29th (*see* Fig. 54, Plate LXI.). The wind had veered to W. or W.S.W. at our western stations, and moderated in most places, with a fall of temperature, while fresh to strong south-westerly gales blew at the southern stations and in the Channel, with warmer weather, and passing over the North Sea, drew into S. at Fanö and Skudesnaes. The following table shows that at several places the gale was marked by a distinct lull, the wind having been at first strong from the southward, and then, after the lull, from the west-south-westward.

| Observatories. Oct. 29–30, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | Midnt. (28th). | S.S.W. | 9 a.m. (29th). | S. | 45 | 10 | 11 p.m. (29th) | S.W. by S. | 23 | 5 p.m. (29th). | S.S.W. | 48 | — |
| Glasgow | 1 p.m. (29th). | S. by W. | — | — | — | — | 8 p.m. (29th) | S.S.W. | 7 | 3 p.m. (29th). | S. by W. | 36 | — |
| | 9 a.m. (30th). | S.W.byW. | — | — | — | — | 3 p.m. (30th) | W.S.W. | 6 | 1 p.m. (30th). | W.S.W. | 38 | — |
| Sandwick | 5 a.m. (30th). | S.W.byW. | 1 p.m. (30th). | W.S.W. | ? | ? | ? | ? | ? | 6 p.m. (30th). | W.S.W. | 53 | Clock stopped at 7 p.m. Gale continued till early next morning. |

| Observatories, Oct. 29-30, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Falmouth | 10 p.m. (29th). | S.W. by S. | 4 a.m. (30th). | S.W.byW. | 43 | 5 | 5 a.m. (31st) | N.W. | 31 | 6 a.m. (30th). | S.W.byW. | 44 | Wind was fresh from S.W. after 11 a.m. 29th. |
| | | | 11 p.m. (30th). | W.S.W. | 42 | 4 | | | | | | | |
| Holyhead | 9 a.m. (29th). | S.S.W. | 3 p.m. (29th). | S. by W. | 44 | 10 | 3 a.m. (30th) | W. by S. | 18 | 8 p.m. (29th). | S. by W. | 48 | Velocity decreased very gradually to 20 miles by midnight. |
| Alnwick Castle | 9 p.m. (29th). | S.W. by S. | — | — | — | — | 9 a.m. (30th) | W.S.W. | 12 | 3 a.m. (30th). | W. by S. | 37 | —— |
| | 10 a.m. (30th). | W.S.W. | 11 a.m. (30th). | W.S.W. | 42 | 2 | 4 p.m. (30th) | W.S.W. | 6 | Noon (30th). | W.S.W. | 43 | —— |

The weather became finer in the south of Ireland, but remained very wet and unsettled elsewhere. In London rain fell all day, and in the evening lightning was seen in Scotland, and a bright aurora at Wick, as well as a slight one at Aberdeen.

The almost entire absence of any recovery in pressure over Ireland as the disturbance passed away, although a distinct rise is recorded in Great Britain on the 31st (*see* Plate LXI.), is very remarkable.

Oct. 31. (Fig. 55.) The barometer had fallen to 28·55 ins. at Christiansund, while it stood at 30·2 ins. over the north of Spain, the steepest gradients lying over the northern stations. Hard westerly gales were blowing in the Shetlands and at Ardrossan, with fresh westerly gales at Fanö and Skudesnaes, while in Ireland and the greater part of England the wind had fallen lighter. During the night, a local disturbance appears to have passed over the north of France; and though our southern barograms show *very* little fall, yet fresh south-westerly gales were felt in the Channel from it, and at 8 a.m. (when its centre lay off our south-east coast) south-westerly gales were blowing over all the north of France. Very wet weather continued. In the afternoon a rise of the mercury had set in except at Valencia. There is also a singular oscillation of pressure is noticeable at Armagh at about 8 p.m. and at Stonyhurst three hours later.

Nov. 1. A very sudden change had occurred over our islands. At all but the Irish stations the barometer had risen quickly during the previous day, the change having been especially rapid at Sumburgh Head. In Ireland, however, a very brisk fall had set in during the night, commencing at Valencia about midnight, and extending to the whole of the kingdom by 9 a.m.

At all the observatories except Valencia the change was accompanied by a considerable increase of temperature and a "backing" of the wind to S. or S.E. At 8 a.m. the

isobars of 29·4 ins. and 29·6 ins., which ran from E. to W. over the North Sea, turned abruptly southwards on the western coast of Great Britain, and recurved westwards equally abruptly over the south of Ireland. Southerly gales were blowing over the Irish stations, and fresh southerly winds in the south of Great Britain; but on our more eastern coasts light W. to S.W. breezes were reported, while south-westerly gales were felt on the eastern shores of the North Sea. Some rain fell at most places, heavily at Valencia, with thunder and lightning, which were subsequently reported at Roches Point and in the north of England. The sea ran high in the Bay of Biscay and was rough on our south-west coasts.

| Observatories. Nov. 1-2, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 2 a.m. (1st). | S.S.E. | 3 a.m. (1st). | S.E. by S. | 44 | 5 | 7 p.m. (1st) | W. | 17 | 5 & 6 a.m. (1st). | S. by E. | 49 | — |
| Sandwick - | Midnt. (1st). | E. | — | — | — | — | 10 a.m. (2nd) | N.E. | 10 | Midnt. (1st). | E. | 33 | — |
| Falmouth - | Noon (1st). | S.S.W. | 6 p.m. (1st). | S.W.byW. | 41 | 4 | Midnt. (1st) | S.W.byW. | 12 | 8 p.m. (1st). | W.S.W. | 42 | — |
| Holyhead - | 8 a.m. (1st). | S. | 9 a.m. (1st). | S. | 45 | 20 | 10 a.m. (2nd) | S.W. by S. | 26 | 10 p.m. (1st). | S.W. | 53 | — |
| Stonyhurst - | 1 a.m. (2nd). | S.W.byW. | — | — | — | — | 3 a.m. (2nd) | S.W.byW. | 2 | 1 a.m. (2nd). | S.W.byW. | 35 | — |
| Alnwick Castle | 3 a.m. (2nd). | W.S.W. | 3 a.m. (2nd). | W.S.W. | 46 | 4 | 10 a.m. (2nd) | S.W.byW. | 7 | 5 & 6 a.m. (2nd). | W.S.W. | 50 | — |
| Kew - - | 5 p.m. (1st). | S.S.W. | — | — | — | — | 9 p.m. (1st) | S.W. | 4 | 6 p.m. (1st). | S.W. by S. | 39 | — |

Both at Yarmouth and Halifax the velocity rose to 30 miles in the evening, but scarcely exceeded that rate.

In the afternoon a sudden recovery set in at Valencia as the disturbance travelled north-eastwards.

Nov. 2. At 8 a.m. the centre of the depression (which was of a very elongated form) lay to the eastward of Scotland—*see* Fig. 56, Plate LXII.—the barometer at 8 a.m. being as low as 28·85 ins. at Aberdeen; and the barograms will show that at a little before 6 a.m. it was at least 0·1 lower than this. South-westerly winds, varying in force from a fresh breeze to a strong gale, swept over France and the North Sea, while in the Shetlands and the north of Scotland moderate to strong north-easterly breezes were reported. In the south of Ireland the wind had already veered to W. and moderated, though in the afternoon it again became strong from that quarter, and in the evening rose to a gale from N.W. in St. George's Channel. The recovery of pressure was rapid (though it did not extend to the south of England till night), and continued at Valencia till mid-day on the 3rd. Rain again fell generally, heavily at Valencia

and Aberdeen, with hail at Oxford, and vivid lightning was seen at Dover in the evening.

Nov. 3. The general distribution of pressure at 8 a.m. and the gales prevailing are shown in Fig. 57, from which it will be seen that the disturbance referred to above was fast travelling away over Scandinavia. Moderate to fresh north-westerly breezes blew over our islands, and the sky was very much clearer than of late, except at Greencastle, where, as well as at several of the French stations, rain continued to fall. In the afternoon the mercury began to fall again in Ireland, the wind returned to the southern quarter, and renewed bad weather soon followed. Aurora was seen at Thurso in the evening, and a thunderstorm occurred at Nairn.

Nov. 4. At 8 a.m. the mercury had fallen nearly half an inch in the south of Ireland since noon of the 3rd, and was still falling fast in all other parts of the kingdom, while over France it had risen quickly. Temperature, after falling in the night, increased rapidly, first in the west and afterwards on our other coasts, Plate LXII. The gradient from Scilly to Valencia was 0·09 in. per 50 miles, and fresh southerly breezes, reaching the force of a gale at Valencia, were blowing all along our western coasts. In the south-east of England, in France, and Holland, the wind was lighter, but in Denmark fresh westerly gales (the remnant of the preceding disturbance) still held. During the day the southerly winds became strong in St. George's Channel, the maximum velocity recorded being 48 miles from S.S.E. at Holyhead. In the evening, too, strong S.W. breezes were felt at Alnwick Castle and Sandwick. The barometer reached its lowest point at Valencia about noon, but scarcely any sign of recovery was shown till midnight, the same peculiarity being noticed later on at all the other observatories. The weather was very unsettled, and lightning was seen at Roche's Point in the evening.

Nov. 5. The centre of lowest pressure was apparently passing northwards some distance to the north-westward of Scotland, and a rather brisk recovery had taken place in Ireland since midnight. The thermometer at 8 a.m. stood from 10° to 19° higher in Great Britain than it did 24 hours before, but a marked fall occurred at all places in the rear of the advancing depression. The wind, which had veered to W. on our western shores, fell light in most places, but the weather remained very cloudy, wet, and unsettled. More disturbed weather was near at hand, and by noon the mercury again began to descend in the south of Ireland, with a "backing" and rapidly increasing wind, and a renewed rise of temperature. Later in the day the change spread to other parts of the kingdom. Aurora was again seen at Wick.

Nov. 6. At 8 a.m. pressure varied from 30·3 ins. in central France to 29·0 ins. on the north-west coast of Scotland, giving a uniform gradient over the whole distance of 0·09 in. per 50 miles. Moderate to strong S.S.W. breezes blew over our islands,

Holland, and Denmark (having blown a fresh gale at Valencia all night), while south-easterly breezes prevailed in Norway, and a moderate westerly breeze in the west of France. The barometrical curves at Armagh, Glasgow, and Aberdeen are very peculiar, the fall having been in each instance seriously interrupted midway, and for a short time even reversed slightly. It is also to be observed that it was not until the fall was resumed (which it was with *great* rapidity in Scotland during the morning) that the wind rose to the severe gale which blew along our western and northern coasts in the afternoon. It would seem from these considerations that the disturbance which first affected the readings at Valencia (on the morning of the 5th) travelled northwards, but was crossed in its rear by a new depression travelling more to the eastwards, and whose track lay over the northern parts of the kingdom, thus producing the second, *deep*, concavity in the Scotch barograms, and the very heavy gale shown in the following table. It will be seen that at Alnwick Castle the velocity nearly reached that of 80 miles an hour.

| Observatories. Nov. 5-7, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | Total No. of Hours the Vel. above 30 Mls. | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 1 p.m. (5th). | S. by E. | 2 p.m. (5th). | S. by E. | 48 | 27 | 10 p.m.(6th) | S.W. | 33 | 1 p.m. (6th). | S.S.W. | 61* | — |
| Armagh | 9 p.m. (5th). | S. by W. | — | — | — | — | 1 a.m. (6th) | S.W. by S. | 4 | 11 p.m. (5th). | S.S.W. | 40 | — |
| | 11 a.m. (6th). | S.S.W. | 2 p.m. (6th). | S.W. | 47 | 4 | 10 p.m. (6th) | S.W. by S. | 11 | 2 p.m. (6th). | S.W. | 52 | |
| Glasgow | 1 a.m. (6th). | S. by W. | — | — | — | — | 4 a.m. (6th) | S.S.W. | 3 | 1–3 a.m. (6th). | S. by W. | 32 | — |
| | 11 a.m. (6th). | S. by W. | 1 p.m. (6th). | S. by W. | 49 | 14 | 4 p.m. (7th) | W.S.W. | 29 | 7 p.m. (6th). | W.S.W. | 60 | |
| Aberdeen | 2 p.m. (6th). | S.S.W. | 3 p.m. (6th). | S.W. | 43 | 5 | 5 a.m. (7th) | W.S.W. | 15 | 5 p.m. (6th). | S.W. | 48 | — |
| Sandwick | 8 p.m. (5th). | S. by W. | — | — | — | — | 9 a.m. (6th) | S.W. | 13 | 11 p.m. (5th). | S. | 39 | — |
| | 8 p.m. (6th). | N.W. | 3 a.m. (7th). | W. | 43 | 18 | 7 a.m. (8th) | W. | 35 | 10 a.m. (7th). | W. by S. | 57 | |
| Falmouth | 9 p.m. (5th). | S.W. | — | — | — | — | 5 p.m. (6th) | W. by S. | 20 | Noon (6th). | S.W. by S. | 40 | — |
| Holyhead | 7 p.m. (5th). | S. | 9 p.m. (5th). | S. | 43 | 23 | 4 p.m. (7th) | S.W. by W. | 45 | 4 p.m. (6th). | S.S.W. | 51 | — |
| Stonyhurst | 8 p.m. (6th). | W.S.W. | — | — | — | — | 5 a.m. (7th) | W.S.W. | 9 | 11 p.m. (6th). | W.S.W. | 36 | — |
| Moorside | 1 p.m. (6th). | S.W. | — | — | — | — | Midnt. (6th) | W.S.W. | 11 | 5 p.m. (6th). | W.S.W. | 38 | — |
| Alnwick Castle | 9 p.m. (5th). | S.W. | 11 p.m. (5th). | S.W. by S. | 46 | 1 | 6 a.m. (6th) | S.W. by S. | 9 | 11 p.m. (5th). | S.W. by S. | 46 | — |
| | 2 p.m. (6th). | S.S.W. | 3 p.m. (6th). | S.W. by S. | 51 | 27 | 6 a.m. (8th) | W. | 40 | 7 p.m. (6th). | S.W. | 79 | |

* It will be seen from Plate LXII. that between noon and 1 p.m. the velocity was nearly 70 miles an hour. The tabulated figure 61 is for the hour from 12.30 to 1.30 p.m.

In the afternoon or evening a recovery ensued on all our coasts, being most sudden at those stations where the depression had caused the greatest fall. Aurora was seen in Scotland at night.

Nov. 7. The centre of the depression lay over central Sweden, where the barometer fell to 28·7 ins., while over the whole of France and Spain it was above 30·3 ins. From Scilly to Christiansund there was a gradient of 0·08 in. per 50 miles, the steepest portion of which lay over the north of Great Britain. The mercury was, however, rising generally, and the wind fell moderate from the westward at nearly all our stations, though it still blew with great severity on the eastern shores of the North Sea and at Ardrossan. The sky became much clearer; and it is remarkable how little rain (comparatively speaking) seems to have fallen during the gale, though some snow and hail occurred in the extreme north. Temperature, which rose to 60° during the southerly wind, fell again very considerably as the wind veered.

Nov. 8. The region of highest pressures (exceeding 30·4 ins.) lay over France, in the midst of a band of 30·3 ins. and upwards which extended from the Bay of Biscay and north of Spain over the whole of France, Germany, and the north of Austria. To the northward pressure decreased to 29·3 ins. at Christiansund, while to the southward it fell to 30·1 ins. at Tunis. In the north of our islands the mercury had risen 0·4 in. since the 7th, and in a less degree elsewhere. Moderate N.W. to W. winds prevailed; but some slight disturbance had crossed the north of England and Ireland during the night, whose influence is clearly perceptible in the Armagh, Stonyhurst, and Aberdeen barograms (Plate LXIII.), and produced local rains and hail, with cloudy weather. Thunderstorms occurred in Caithness.

Nov. 9. Barometrical pressure began to give way again, slowly, in all parts of western Europe, the change commencing in the east of France, and afterwards extending to the North Sea and all parts of Western Europe. At the same time temperature fell except in the north-east of France. Light westerly winds blew in nearly all places, but over Spain and the southern part of the Bay of Biscay, E. to N.E. winds showed themselves. In the afternoon the mercury began to fall more quickly and the wind veered northwards, the lowest reading being recorded near midnight at all the observatories. The weather was very showery, with hail in some places. Aurora was seen at Wick, thunderstorms occurred at our south-western stations and lightning was seen at Liverpool.

Nov. 10. At 8 a.m. a large area of comparatively low pressure was found over the North Sea, nearer to its eastern than its western shores, and gradients were rather steep across our islands for northerly, and across France for north-westerly winds (Fig. 58, Plate LXIII.). The barometer was rising at all our stations, most in Scotland, and temperature again showed a marked reduction. The north-westerly breezes which

prevailed throughout the British Isles and France were moderate for the most part, but at exposed points they blew with great strength, attaining the force of a gale at Aberdeen, in the Irish Sea, and the Bay of Biscay, with squalls of snow and hail. As the day advanced the low pressure moved south-eastwards, and the wind moderated somewhat in the west, but freshened in the S.E. Bright aurora was seen in the Shetlands at night, and at Shields next morning. Thunder was heard at Scarborough, and in Lincolnshire.

| Observatories. Nov. 10-11, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Sandwick | 2 a.m. (10th). | N.E. | 3 a.m. (10th). | N.E. | 41 | 2 | 9 a.m. (11th) | N. | 31 | 3 & 4 a.m. (10th). | N. | 41 | — |
| Falmouth | Midnt. (9th). | W. by N. | 4 a.m. (10th). | N.W.byW. | 41 | 6 | 6 p.m. (10th) | N. | 18 | 3 p.m. (10th). | N.W. | 42 | — |
| Holyhead | 5 p.m. (9th). | S.W. by W. | 2 a.m. (10th). | W.N.W. | 49 | 32 | 4 p.m. (12th) | N.E. by N. | 71 | 10 a.m. (10th). | N. | 61 | — |
| | | | 5 p.m. (11th). | N. by W. | 43 | 14 | | | | | | | |

At Valencia a strong north-westerly breeze was felt at 6 a.m., and a fresh N.N.E. wind at Yarmouth by noon.

Nov. 11. The region of lowest pressures lay over Germany. In our islands the recovery had been brisk, while even over Holland the barometer had risen somewhat. Northerly winds continued to blow generally, drawing to N.W. at the south-eastern stations, while at Cuxhaven and the Helder north-easterly breezes formed the polar side of the circulation round the low pressure.* The sky cleared in the west, but showers of hail still fell in the north and east, and heavy thunder and hail were reported at Scilly. Aurora was seen at Sandwick in the evening.

During the next two days the disturbance travelled slowly to the southward, while the barometer rose over the British Islands and the north of Europe. North-easterly breezes consequently prevailed very generally throughout the north-west of Europe, and on the 13th (when pressure decreased over the north of Germany) they rose to a fresh or strong gale on the eastern and southern shores of the North Sea and in St. George's Channel (*see* Fig. 59, Plate LXIV.), and to a moderate or fresh breeze over other parts of the United Kingdom, while at Corunna the wind drew into a gale from N., and from N.W. in the south of France.

* The two complete retrograde rotations of the vane at Stonyhurst at noon are very remarkable, and indicate how little weight can be attached to a mere enumeration of the number of times the vane has rotated in the one direction or the other.

| Observatories. Nov. 12-16. 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Holyhead - | 11 a.m. (13th). | N.E. by E. | 1 a.m. (14th). | N.N.E. | 46 | 18 | 8 a.m. (15th) | N.E. | 45 | 8 a.m. (14th). | N. by E. | 58 | — |
| Yarmouth - | 3 a.m. (12th). | N.E. by N. | Noon. (12th). | E. | 54 | 70 | 9 p.m. (16th) | S.S.W. | 114 | 4 p.m. (13th). | N.E. | 61 | — |
| | | | 8 a.m. (16th). | S.E. | 46 | 12 | | | | | | | |

Temperature was low, and showers of hail, with snow, were prevalent, especially in Scotland and the north of Ireland. On the 13th, however, the pressure began to decrease very slowly at nearly all the observatories—most in Scotland. It is remarkable that none of the other anemometers felt this gale.

Nov. 14. A considerable fall of the barometer had taken place, except at the southern French stations, and a well-marked depression (whose steepest gradients were on its north-west side) advanced *from the E. or E.N.E.* over Belgium, the Straits of Dover, and the north-east of France (Fig. 60), Plate LXIV. On the eastern shores of the North Sea the gale continued, and in our islands the wind increased considerably, especially at Shields. At Corunna and Toulon, however, the gales had died down. Temperature rose in many places, but unsettled showery weather continued, with hail and snow at several stations. At Portishead the clouds were sometimes very heavy and black, with showers of sleet. During the day the depression moved south-eastwards, becoming partially filled up as it did so, and the weather improved temporarily. Hoar frost had occurred at Valencia on the previous night.

Nov. 15. The depression now lay over the western parts of France, and a rise of the barometer had consequently taken place over our islands, especially in the south-east (Fig. 61. Plate LXIV.). A fresh fall had, however, commenced at Cuxhaven, which, with the east-north-easterly winds on the Dutch coasts, and a north-westerly breeze at Brussels, pointed to a new disturbance advancing *from the eastward* on the south-eastern stations. Shortly after 9 a.m. the barometer began to fall very briskly at Kew, followed by those at our other observatories, though the change at Valencia was very slight. The fall shown at Stonyhurst after 8 p.m. is very singular, and appears to indicate the existence of some additional disturbance in that neighbourhood, a similar indication being offered by the divergence of the isobars shown on the 8 a.m. chart of the 16th (see Fig. 62). The wind backed to N. in the south-east and freshened considerably during the afternoon, as will be seen from the Kew curves, Plate LXIV. Aurora was again seen at Sandwick in the evening.

Nov. 16. The distribution of pressure at 8 a.m. and the gales reported at that time are shown in Fig. 62, from which it will be seen that a small but well-marked depression was then lying over the Straits of Dover and our south-eastern counties, the barometer having been rising at Cuxhaven during the night.

| Observatories. Nov. 16, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Aberdeen - | 10 a.m. (16th). | — | — | — | — | — | Noon (16th) | S.E. by S. | 2 | 11 a.m. (16th). | E.N.E. | 35 | — |
| Falmouth - | 9 a.m. (16th). | N.W. | — | — | — | — | 4 p.m. (16th) | W.N.W. | 7 | 11 a.m. (16th). | N.W.byW | 36 | — |
| Holyhead - | 6 p.m. (15th). | N.N.E. | 6 p.m. (15th). | N.N.E. | 50 | 20 | 2 p.m. (16th) | N.E. | 20 | 8 a.m. (16th). | N. by W. | 62 | — |
| Alnwick Castle | 3 a.m. (16th). | N.E. | — | — | — | — | 8 a.m. (16th) | N.N.E. | 5 | 5 a.m. (16th). | N.E. by N. | 33 | — |
| Kew - - | 5 p.m. (15th). | N. by W. | — | — | — | — | 9 p.m. (15th) | N. by W. | 4 | 6 p.m. (16th). | N. by W. | 34 | — |

In the east of Scotland, the west of our islands, and the west of France, fresh to strong N. to N.W. breezes were blowing, reaching the force of a strong gale at Holyhead, while south-easterly winds prevailed in the Netherlands and north-east of France, with E. to N.E. winds in Denmark, Norway, and the Shetlands. Thus the circulation round the low pressure was complete, and very heavy rains were experienced along our east and south-east coasts, as well as at Biarritz, but in the former case the rain accompanied easterly, and in the latter westerly breezes. Rain, but in less quantity, fell also in most parts of the kingdom. Towards the latter part of the day the barometer rose a little generally.

Nov. 17. A singular change had taken place. The barometer stood rather higher at all the French, English, and Norwegian stations than on the previous morning, but rather lower in Denmark, Ireland, and Scotland. The isobar of 29·8 ins. enclosed a large shallow depression which covered England, the Irish Sea, and Belgium, having three distinct small areas of readings below 29·7 ins. within it. One of these (the largest) lay over Norfolk, Suffolk, and Kent, a second had its centre at Nottingham, and the third at Holyhead. The winds over England were consequently extremely light and variable, but northerly breezes blew over Ireland, drawing into N.W. and S.W. over France, while north-easterly breezes were felt in the south of Norway, and east-south-easterly at Sumburgh Head. Heavy rain had again fallen in the Straits of Dover, and a less quantity elsewhere. Owing to the death of the observer at Yarmouth the amount which fell there cannot be stated with certainty. The sky was still very cloudy at 8 a.m. and rain continued to fall in the south-east, but shortly before noon an entire change began to set in by the sudden giving way of pressure in the west.

Nov. 18. The mercury had descended at all stations except Toulon, the change amounting to half an inch at Christiansund, Sumburgh Head, and in the west of our islands, but to less than 0·2 in. at our south-eastern stations. An elongated depression lay from north to south over Ireland, and a second (smaller one) was found off the north-east coast of England, but gradients were nowhere very steep. Light south-westerly winds were felt in England, but at Valencia, after a temporary shift to the southward, it had veered to the north-westward again and blew freshly. In the west of France the wind was fresh to strong from W., but drew round gradually to S.W. in Belgium, while very fresh E. to S.E. breezes were felt on the eastern shores of the North Sea. Temperature rose slightly, and wet unsettled weather was prevalent.

Nov. 19. The area of low readings noticed yesterday had crossed the British Isles and lay over Holland, but pressure after recovering on our coasts (most in the S.E.) had been falling again rapidly in the west. This new decrease was accompanied, as usual, with a rise of temperature, a return of strong southerly winds, with rain, and soon extended to all parts of our islands. A great deal of thick fog prevailed between the two depressions, and great terrestrial radiation had occurred in the north of England during the night. The easterly winds remained fresh in Denmark and Norway, while in the south of France the wind drew into S.W. The new system now travelled north-eastwards and became very extensive, while the strong southerly winds reached our northern stations. It will be seen that whereas at Valencia the minimum reading was reached about 8 a.m. on the 19th, and was not soon followed by a recovery, at Aberdeen the lowest pressure did not occur till 3 a.m. on the 20th, and a recovery set in at 6 a.m.

Nov. 20. At 8 o'clock barometrical readings varied from 30 ins. in the south of France to 28·9 ins. in the north of Scotland. The region of depression which lay off or over the Hebrides, was moving north-eastwards, and the barograms show (Plate LXV.) that the mercury was rising generally. Temperature had increased very much in England, and while moderate to fresh south-westerly breezes blew over France and the British Islands, they drew into S. on the coast of Denmark, and S.E. in Norway. A strong S.E. breeze was felt also at Sumburgh Head. Rain had fallen generally, and though the sky was now clearing, showers continued in the west. In the evening lightning was seen at Roche's Point, aurora at Cambridge.

Nov. 21. The rise of the barometer had been very brisk in the north and east. Pressure was still highest in the south-east of France, and lowest on our north-west coast, and gradients were rather steep. The wind had fallen light generally and backed a little in most places, while clouds increased in the west, with showers. In the afternoon an oscillation of pressure occurred at the Irish observatories, causing a very considerable increase of squally southerly winds in the west of England. The small depression which caused this oscillation travelled north-eastwards, its effect on the Glasgow barogram and anemogram that evening being very considerable, as well as

at Aberdeen about 2 a.m. 22nd. *See* Plates LXV. and LXVI. Its chief results as shown by our various anemographs are given in the following table.

| Observatories, Nov. 21-22, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Aberdeen | Midnt. | S.S.E. | — | — | — | — | 2 a.m. (22nd) | S. by W. | 2 | 1 a.m. (22nd). | S. by E. | 41 | For one hour only. |
| Sandwick | 6 a.m. (22nd). | W.S.W. | — | — | — | — | 8 a.m. (22nd) | W.S.W. | 2 | 6 a.m. (22nd). | W.S.W. | 40 | — |
| Falmouth | 6 a.m. (21st). | S. by W. | 11 a.m. (21st). | S. | 43 | 7 | 7 p.m. (21st) | S.W.byW. | 13 | 4 & 5 p.m. (21st). | S. | 45 | — |
| Holyhead | 9 a.m. (21st). | S.S.E. | 4 p.m. (21st). | S.S.E. | 50 | 6 | Midnt. (21st) | S. by W. | 15 | 7 p.m. (21st). | S.S.E. | 66 | — |
| Stonyhurst | 7 p.m. (21st). | S. by E. | 9 p.m. (21st). | S. by E. | 42 | 2 | 11 p.m. (21st) | S.W. | 4 | 9 & 10 p.m. (21st). | S. | 42 | — |
| Moorside (Halifax). | 9 p.m. (21st). | S. | — | — | — | — | 11 p.m. (21st) | S.W. by S. | 2 | 10 p.m. (21st). | S. by W. | 35 | — |
| Alnwick Castle | 11 p.m. (21st). | S. | — | — | — | — | 2 a.m. (22nd) | S.W. by S. | 3 | Midnt. (21st). | S.S.W. | 36 | — |

A marked increase of wind at Sumburgh Head and the Norwegian stations, a few hours subsequently, is traceable to the same cause.

Nov. 22. The *relative* distribution of pressure over the north-west of Europe differed little from that of the 21st, but considerable unsteadiness is observed in most of the barograms during the morning (Plate LXVI.). Light to moderate south-westerly and southerly breezes were felt generally except at the most northern stations, where the disturbance mentioned yesterday was causing fresh gales locally (westerly at Sumburgh Head, and south-easterly at Skudesnaes), with showery weather. Shortly before noon a very sudden and serious fall of the barometer commenced in Ireland, spreading quickly to all parts of the kingdom, and continuing, with some slight interruptions, till next morning. Towards night the wind rose to a very heavy gale from the southward, beginning first on our south-west coasts, and heavy rain set in (Fig. 63, Plate LXVI.). In addition to the general disturbance which was advancing on us from the Atlantic, a small one seems to have passed up St. George's Channel in the evening, greatly intensifying the winds on our W. and S.W. coasts, and giving to the gale a suddenness altogether unusual.

Nov. 23. Fig. 64 shows that at 8 a.m. the centre of a *very* deep depression, with precipitous eastern and south-eastern sides, lay off Valencia, where the barometer stood 1·6 ins. lower than it did at Toulon. The gradient from L'Orient to Roche's Point was 0·13 in. per 50 miles. A very severe southerly gale had been blowing on the western and south-western coasts during the night, the force for a time almost equalling that of a hurricane, but as yet it had not reached our more northern stations, and a fresh southerly gale had set in over all the south of England. Temperature rose, especially in England, and during the day, as the depression travelled northwards, the gale extended to our north-west coasts. At the mouth of the Channel it blew with

great violence all day, even after the mercury had begun to rise, but subsided towards midnight. The most remarkable points noticeable in this disturbance are the extreme suddenness with which it spread over us, the number of temporary lulls and shifts of wind which occurred in the south-west and south (see Plate LXVI. and the following table), and the great violence attained in several places, notably at Holyhead, where the velocity did not fall below 40 miles for 49 hours.

| Observatories. Nov. 23-24, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours, the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 5 p.m. (22nd). | E.S.E. | 6 p.m. (22nd). | E.S.E. | 44 | 8 | 2 p.m. (23rd) | S. by W. | 21 | 8 a.m. (23rd). | S.S.E. | 50 | The lull which took place between 2 p.m. and 6 p.m. 23rd was very well marked. |
| | | | 7 a.m. (23rd). | S.E. by S. | 45 | 3 | | | | | | | |
| | 6 p.m. (23rd). | W.S.W. | 7 p.m. (23rd). | W.S.W. | 41 | 1 | Midnt. (23rd) | S.W.byW. | 6 | 7 p.m. (23rd). | W.S.W. | 41 | |
| Glasgow | 6 p.m. (23rd). | S. | — | — | — | — | 8 p.m. (23rd) | S. by E. | 2 | 6 & 7 p.m. (23rd). | S. | 36 | — |
| Aberdeen | 4 p.m. (23rd). | S. by E. | — | — | — | — | 2 a.m. (24th) | S. by W. | 10 | Midnight (23rd), and 1 a.m. (24th). | S. by E. | 39 | Velocity had exceeded 30 miles for 3 hours after 7 a.m. |
| Sandwick | 7 p.m. (23rd). | S.S.E. | — | — | — | — | 3 a.m. (24th) | S. by E. | 8 | 11 p.m. and midnight (23rd), and 1 a.m. (24th). | S. by E. | 35 | — |
| Falmouth | 7 p.m. (22nd). | S. | 8 p.m. (22nd). | S. by E. | 50 | 27 | Midnt. (23rd) | S.W. by S. | 29 | 3 a.m. (23rd). | S. by W. | 59 | — |
| Holyhead | 8 p.m. (22nd). | S.S.E. | 2 a.m. (23rd). | E. by S. | 54 | 29 | 9 p.m. (24th) | S.W. by S. | 49 | 7 p.m. (23rd). | S.S.E. | 80 | One of the cups of the anemometer was blown off during the night of of the 23rd. |
| Stonyhurst | 5 a.m. (23rd). | S. by E. | 11 a.m. (23rd). | S. | 45 | 11 | 5 a.m. (24th) | S. by W. | 24 | 10 p.m. (23rd). | S. | 56 | — |
| Moorside (Halifax). | 7 a.m. (23rd). | S. by W. | Noon (23rd). | S. by W. | 43 | 13 | 8 a.m. (24th) | S.W. by S. | 25 | 10 p.m. (23rd). | S.S.W. | 55 | — |
| Alnwick Castle | 9 p.m. (23rd). | S. by W. | 5 a.m. (24th). | S.W. by S. | 45 | 2 | 9 a.m. (24th) | S.W. by S. | 12 | 7 a.m. (24th). | S.W. by S. | 45 | — |
| Kew | 4 a.m. (23rd). | S. | 11 a.m. (23rd). | S. by W. | 42 | 2 | 4 p.m. (23rd) | S.S.W. | 12 | 11 a.m. (23rd). | S. by W. | 43 | The lull was well marked both at Kew and Yarmouth. |
| | 6 p.m. (23rd). | S.S.W. | — | — | — | — | 1 a.m. (24th) | S.S.W. | 7 | 10 p.m. (23rd). | S. by W. | 34 | |
| Yarmouth | 4 a.m. (23rd). | S. | — | — | — | — | 4 p.m. (23rd) | S.S.W. | 12 | 11 a.m. (23rd). | S. by W. | 37 | — |
| | 11 p.m. (23rd). | S.S.W. | — | — | — | — | 7 a.m. (24th) | S.W. by S. | 8 | 11 p.m. (23rd). | S.S.W. | 34 | |

Captain Donkin of the ship "Inverness," was blown back "hove to" from the Lizard to the Casquets by this gale, and remarks that only for two hours did he experience stronger wind in the Madras hurricane of May 2 of this year, which the "Inverness" with two other ships rode out at anchor, than he felt during the prevalence of this gale in the English Channel. The minimum pressure was reached at Valencia by 7 a.m., but not until 1 a.m., 24th, at Aberdeen.

By 8 a.m. on the 24th the centre of lowest pressure lay to the north-westward of Scotland. The readings at Thurso and Sumburgh Head were as low as 28·6 ins., while

that at Valencia, having risen 0·6 in. since the previous morning, was now at 29 ins. In central France pressure had become very uniform at about 29·7 ins. Gradients were steepest over the northern part of the North Sea. The mercury was rising generally, rapidly in the north-west. The south-westerly gale had now subsided at our south-western and southern stations, but continued with considerable force at several of the northern ports, in the Straits of Dover, and the west of France, while Skudesnaes felt a fresh gale from S.S.E. Temperature had fallen except in the northern parts of the kingdom, and during the day the weather, though still unsettled, became temporarily much quieter. At about midnight, however, the Irish barometers again began to fall rapidly (Plate LXVI.), the wind first lulling to a dead calm and then springing up with considerable violence from the south-eastward, with rain.

Nov. 25. A very deep depression lay over the south-west of Ireland at 8 a.m., gradients being steepest at the mouth of the Channel (Fig. 66, Plate LXVI.). A strong southerly gale and heavy rain had again been felt in the west of France and on our south-west coasts in the night; and later on, as the centre of disturbance travelled north-north-eastwards, it spread to almost all parts of the kingdom, as will be seen by the table below.

| Observatories, Nov. 25–27, 1872. | Velocity, 30–40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 3 a.m. (25th). | E. by S. | 11 a.m. (25th). | S. by E. | 53 | 21 | 1 a.m. (27th) | S.W. | 46 | 1 a.m. (26th). | S. by W. | 60 | — |
| | | | 4 p.m. (26th). | S. by W. | 45 | 5 | | | | | | | |
| Armagh | 9 a.m. (26th). | S.S.W. | — | — | — | — | 3 p.m. (26th) | S.W. | 6 | 11 a.m. (26th). | S.W. | 35 | — |
| Glasgow | 11 a.m. (26th). | S. by W. | — | — | — | — | 6 p.m. (26th) | S.W. | 7 | 2 p.m. (26th). | S.W. | 35 | — |
| Falmouth | 6 a.m. (25th). | S. | 3 p.m. (26th). | S.S.W. | 45 | 3 | 9 a.m. (27th) | S.W.byW. | 51 | 4 p.m. (26th). | S.S.W. | 46 | — |
| Holyhead | 7 a.m. (25th). | S.S.E. | 1 p.m. (25th). | S.E. by E. | * | * | * | * | * | * | * | * | — |
| Stonyhurst | Noon (26th). | S.W. | — | — | — | — | 2 p.m. (26th) | S.W. | 2 | 1 p.m. (26th). | S.W. | 32 | — |
| Moorside | Midnt. (25th). | S.W. | — | — | — | — | 5 a.m. (26th) | S.W. by S. | 5 | 1 a.m. (26th). | S.W. by S. | 40 | — |
| Alnwick Castle | 11 a.m. (26th). | S.W.byW. | 11 a.m. (26th). | S.W.byW. | 45 | 10 | 3 a.m. (27th) | W.S.W. | 16 | 2 p.m. (26th). | S.W.byW. | 54 | — |
| Kew | 2 p.m. (25th). | S by W. | — | — | — | — | 8 p.m. (25th) | S.S.W. | 6 | 2 p.m. (25th). | S. by W. | 36 | — |
| | 2 a.m. (26th). | S.W. by S. | — | — | — | — | 5 a.m. (26th) | S.W. | 3 | 4 a.m. (26th). | S.W. by S. | 36 | |
| | 11 a.m. (26th). | S.W. | 6 p.m. (26th). | S.S.W. | 43 | 3 | 9 p.m. (26th) | S.W. | 10 | 6 & 7 p.m. (26th). | S.S.W. | 43 | |
| Yarmouth | 10 a.m. (26th). | W.S.W. | — | — | — | — | 3 p.m. (26th) | S.W.byW. | 5 | 9 p.m. (26th). | S.W. by S. | 39 | — |
| | 7 p.m. (26th). | S.W. by S. | — | — | — | — | Midnt. (26th) | W.S.W. | 5 | | | | |
| | 4 a.m. (27th). | W.S.W. | — | — | — | — | 1 p.m. (27th) | W. | 9 | | | | |

* All the cups of anemometer were removed for repair at 4 p.m., so that we have no record of the gale after that time.

Armagh and Glasgow do not seem to have experienced any velocity exceeding 35 miles an hour, but there is little room for doubt that at Holyhead a far greater force was felt than that registered prior to the taking down of the cups for repair. Rain was, of course, very prevalent. Thunderstorms occurred both in the south-west and south-east of the country, and aurora in the north at night time.

Nov. 26. The lowest pressures now lay over our north and north-west coasts (Fig. 67), the whole of north-western Europe feeling the effects of the disturbance. In the south-west of Norway the mercury had fallen more than half an inch. The wind had veered westwards on our south-west coasts, but remained strong, and drew round to S.S.W. over the more eastern counties, while a fresh south-easterly wind was felt at Skudesnaes. The central area was apparently very large, and the fact that, while it still lay over Scotland the Norwegian pressures had given way so rapidly, accounts for the absence of gales from the eastern Scotch coasts. Temperature rose quickly in general, but at Nairn it remained singularly low locally. The weather was squally and unsettled. Aurora and lightning were seen in Dublin.

By 8 a.m. on the 27th the depression had moved eastwards and lay over Scandinavia, a rapid rise of the mercury having taken place in our islands and France, especially in the north-west. A fresh S.W. gale still prevailed in the Netherlands and north-east of France, with fresh breezes from the same quarter in the south-east of England and over the North Sea, but in the west and north the wind had veered and moderated, being now westerly in Ireland and northerly in the north of Scotland. The barometer continued to rise all day, the weather became much finer than of late, and at night much colder in the west and north, where, too, auroræ and meteoric showers were observed.

Nov. 28. The barometer, though still highest in the south of France and lowest in Norway, was very much more uniform over western Europe than of late, especially in the United Kingdom, where variable airs, calms, and fogs prevailed. In France the wind was still fresh from the south-westward, while in Denmark and the south of Norway it was westerly. Pressure had, however, again begun to decrease in the west, and soon did the same on our other coasts, while the wind returned to S. at Valencia. Thus commenced a fresh series of disturbances which reached their maximum intensity at the close of the month.

Nov. 29. At 8 a.m. pressure varied from about 30 ins. in the south of France to 29·2 ins. at Valencia, where, however, the mercury was falling very quickly. Temperature had risen in the west and north-west, and moderate southerly breezes prevailed along our western coasts, with light airs from the same quarter in other parts of our Islands and Holland. In France the wind was more westerly. Rain had fallen in the west and south, and soon spread to the northern stations also. During the day the barometrical fall continued generally, most rapidly in Ireland, where the wind, after backing to S.E., veered to S. again and rose to a fresh gale, which subsequently spread to most of the other coasts.

Nov. 30. The general condition of pressure at 8 a.m. is exhibited in Fig. 69, Plate LXVII., which shows a very deep, though small, depression lying over the south of Ireland, and a second (shallow one) off our north-east coast. Moderate to fresh southerly gales were at this time blowing in St. George's Channel, a south-westerly gale at Paris, and an easterly gale at Sumburgh Head. Elsewhere light to fresh but squally southerly or south-east winds were general. At noon a whirlwind occurred at Newbottle near Banbury, and swept across the country for 2 miles. A very complete account of the phenomenon is given in Symon's Meteorological Magazine for 1873. The following table gives the details from the anemograms.

| Observatories. Nov. 29-30, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 9 a.m. (29th). | S.E. by E. | Midnt. (29th). | S.E. | 42 | 4 | 4 a.m. | (30th) | S.E. | 19 | 2 a.m. (30th). | S.E. | 46 | —— |
| Aberdeen - | 1 a.m. (30th). | S.S.E. | — | — | — | — | Noon | (30th) | S.E. by E. | 11 | 7, 8, and 9 a.m. (30th). | S.E. by S. | 36 | —— |
| Sandwick - | 4 a.m. (30th). | S.E. by S. | — | — | | — | 11 a.m. | (30th) | S.E. by E. | 7 | 8 a.m. (30th). | S.E. | 42 | For one hour only. Squally all day. Wind increased to 40 miles again at 5 p.m. |
| Falmouth - | 8 a.m. (30th). | S.S.W. | — | — | — | — | 5 p.m. | (30th) | S.W. by S. | 9 | 11 a.m. (30th). | S. | 42 | For one hour only. |
| Holyhead - | 5 a.m. (30th). | S.E. by S. | — | — | — | — | 6 p.m. | (30th) | E.S.E. | 13 | Noon and 1 p.m. (30th). | S.E. | 40 | |
| Yarmouth - | 10 p.m. (29th). | S.E. by S. | — | — | — | — | 1 a.m. | (30th) | S. by W. | 3 | 11 p.m. (29th). | S.E. by S. | 52 | For one hour only. |

Temperature had risen in Great Britain. By 6 p.m. very little motion had occurred in the Irish depression, while that off our north-east coasts disappeared over the North Sea (*see* Fig. 70). Rain fell at all stations, hail at Aberdeen, while thunder and lightning occurred in the south of England during the evening. The report for Yarmouth in the above table is very remarkable, an extraordinarily sudden squall having occurred at 11.15 p.m. without any change in the direction of the wind.

Dec. 1. The centre of lowest pressure now lay over the south-east of Ireland (*see* Fig. 71, Plate LXVII.). The reading at Roche's Point was as low as 28·67 ins., and over nearly the whole of our islands pressure was below 29 ins. As, however, gradients were not steep the winds were only moderate to fresh in force (except at Sumburgh Head, where a strong easterly gale was blowing), but they circulated round the area of lowest pressure, so that while fresh S.S.W. breezes were felt in France and England, light south-easterly winds were blowing at our northern stations, and light northerly in the south of Ireland. Temperature showed very little change, but the weather remained cloudy and wet. Thunder occurred at L'Orient.

Dec. 2. A very singular change had taken place. Readings were much higher on all our coasts than on the previous day, but had fallen a little in the south of France. The Irish depression had entirely disappeared, but a shallow one showed itself over the southern parts of the Bay of Biscay (Fig. 72, Plate LXVIII.). The wind fell light generally (Sumburgh Head being still excepted), and drew eastwards on all our coasts as well as in the north of France, while light S. to S.E. winds were felt in the south of France, and a N.N.W. breeze at Corunna. Temperature fell a few degrees in all places, and the weather, though still cloudy, became much finer in the west. As the day wore on, the new disturbance advanced north-eastwards, and at 6 p.m. its centre lay over or near Rochefort. The wind freshened from N. at Holyhead and from N.E. at Yarmouth, and N.E. winds set in at our south-western stations.

Dec. 3. At 8 a.m. a band of pressure rather below 29·4 inches was extended over the west and north of France, Belgium, and Holland, the lowest readings of all (rather below 29·2 ins.) being still near Rochefort (Fig. 73, Plate LXVIII.). The barometer had, however, risen at all our northern and western stations as well as in the south of France, so that while there were moderate gradients for north-easterly winds over this country, there were steep ones for S.W. breezes in the south of France; and we find these currents of wind prevailing in those regions respectively. Temperature decreased somewhat at Skudesnaes, in the north of Scotland, and in the east of Ireland, but rose elsewhere; and showers of snow, hail, and rain fell in Scotland at evening. Aurora was seen at Wick and Aberdeen.

Dec. 4. The mercury continued to rise on our coasts, while the low pressures moved eastwards towards Germany. The wind backed to N. generally and freshened at our eastern stations, as well as in Holland and Belgium, reaching the velocity of 40 miles an hour at Yarmouth by 5 a.m. The weather became much colder but finer. In the evening a change set in, commencing with a fall of the barometer at Valencia, and accompanied by a rise of temperature in the extreme south. Bright aurora was seen in Scotland.

Dec. 5. Pressure had increased rapidly over the south-west and centre of France, but was falling fast in Ireland and Scotland. Readings were highest over the Bay of Biscay, and a narrow band of comparatively high readings ran thence across the North Sea to Oxö (Fig. 74, Plate LXVIII.). Gradients in the west began to be steep for southerly winds. Temperature rose rapidly at the mouth of St. George's Channel, and southerly breezes, which became very strong during the morning, set in over Ireland. As the day advanced the decrease of pressure in the west extended eastwards, together with the freshening southerly wind, rapidly increasing temperature, and rainy weather. Snow fell at Thurso, York, and Cuxhaven.

Dec. 6. The centre of a very serious depression lay near the Hebrides, where the mercury had descended more than an inch in the 24 hours (Fig. 75). The

rise of temperature had been very considerable, and while strong westerly breezes prevailed on our western coasts, they drew into S.W. and S. over the North Sea, to S.E. in the south of Norway, and to E. at Sumburgh Head. In many places the force of a stiff gale had been reached in the night, and still held at the most northern stations.

| Observatories. Dec. 5-6, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | 4 a.m. (5th). | S. by E. | 9 a.m. (5th). | S. | 45 | 5 | 5 a.m. (6th) | W.S.W. | 25 | 11 a.m. (5th). | S. by W. | 51 | — |
| Aberdeen - | 2 p.m. (5th). | S. by E. | — | — | — | — | 9 p.m. (5th) | S. by E. | 7 | 5 p.m. (5th). | S. by E. | 40 | — |
| Sandwick - | Noon (5th). | S.S.E. | 3 p.m. (5th). | S.S.E. | 45 | 8 | 1 a.m. (6th) | S.S.E. | 13 | 5 p.m. (5th). | S.S.E. | 48 | — |
| Falmouth - | 4 p.m. (5th). | S.W. by S. | — | — | — | — | 9 p.m. (5th) | W. | 5 | 7 p.m. (5th). | S.W. | 39 | — |
| Holyhead - | 8 a.m. (5th). | S.S.E. | 9 a.m. (5th). | S.S.E. | 45 | 10 | 8 p.m. (5th) | S.W. | 12 | 2 p.m. (5th). | S. by E. | 54 | The velocity again increased to 35 miles by 6 a.m., 6th. |
| Stonyhurst - | 6 p.m. (5th). | S. | — | — | — | — | 9 p.m. (5th) | S.W. by S. | 3 | 8 p.m. (5th). | S. | 34 | — |
| Alnwick Castle | 8 a.m. (6th). | S.W. | — | — | — | — | Midnt. (6th) | S.W. by W. | 16 | 9 a.m. (6th). | S.W. by S. | 45 | For one hour only. |
| Yarmouth - | 10 p.m. (5th). | S. by W. | — | — | — | — | 2 a.m. (6th) | S.S.W. | 4 | Midnt. (5th). | S.S.W. | 33 | — |

At Armagh and Glasgow also 30 miles was slightly exceeded, in the former case from S., in the latter from S.W. During the day the disturbance appears to have made but little progress; but a slight fall took place at Valencia shortly before noon, and was subsequently experienced in a much more marked manner at Falmouth as well as at Kew (Plates LXVIII. and LXIX.).

Dec. 7. A partial recovery had taken place in the north-west of our islands, and during the night a small but well-marked depression had travelled up the English Channel, causing the hollows in the Kew, Falmouth, and Valencia curves noted above. From the shifting of the wind at Falmouth it is evident that the centre passed to the southward of that station. At 8 a.m. it lay over Belgium (Fig. 76, Plate LXIX.), but, as will be seen, the lowest readings of all were still to the northward of Scotland. Two circulations of wind were consequently experienced, that round the northern depression giving us westerly breezes over Ireland and England, moderate south-south-westerly in the north-east of Scotland, fresh ones at Sumburgh Head and Oxö, while a fresh south-easterly wind was felt at Skudesnaes. The more southern depression, however, not merely modified for a time the force of the westerly wind in central and north-eastern England, but after causing south-west to north-west gales in the north of France during the night was now giving us moderate north-westerly breezes in the Straits of Dover, strong S.W. winds in Belgium, and light to fresh south-

easterly in Holland and Denmark. Temperature rose rapidly in the east of France, and a few degrees on the eastern shores of the North Sea, but fell a little both in the Channel and in central England. A great deal of rain had fallen both in the south and north of Great Britain, but the sky was now clearing in the south. No sooner had the local disturbance passed off than the wind became generally west-south-westerly again and blew freshly, with showers. Frequent lightning was seen in the south at evening, and a lunar halo at Aberdeen, while the weather again became showery and unsettled in most places.

Dec. 8. At 8 a.m. pressure varied from 30·1 ins. at Biarritz to 28·7 ins. at Sumburgh Head, the gradient being very regular throughout. The barometer had, however, been falling *very* rapidly at Valencia since about 6 a.m., and by 2.30 p.m. reached the low reading of 28·66 ins. A very serious depression advanced directly over the south of Ireland from the south-westward, and at 6 p.m. its centre lay over St. George's Channel (Fig. 77, Plate LXIX.). The gradient from Valencia to Roche's Point at this time was 0·20 in., that from Brest to Pembroke was 0·195 in., and that from London to Pembroke 0·13 in.; per 50 miles. Very severe gales were blowing from N.W. in the south of Ireland, from W.S.W. in the Channel, and S.S.W. both at London and Portishead, while a fresh S.S.E. breeze was felt at Holyhead, and light E. to N.E. winds at our most north-western stations.

| Observatories. Dec. 8-9, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 3 p.m. (8th). | W.N.W. | 3 p.m. (8th). | W.N.W. | 47 | 2 | 10 p.m. (8th) | W. by S. | 7 | 3 p.m. (8th). | W.N.W. | 48 | A strong gust of wind (force 48 miles per hour) blew just before noon, 8th, velocity *at* noon only 18 miles. |
| | 2 a.m. (9th). | W.S.W. | — | — | — | — | 11 p.m. (9th) | W. | 21 | 11 a.m. (9th). | W.S.W. | 40 | |
| Falmouth | 11 a.m. (8th). | S.S.W. | 1 p.m. (8th). | S. | 52 | 12 | 9 p.m. (9th) | W. | 34 | 5 p.m. (8th). | W.S.W. | 67 | — |
| Holyhead | 1 p.m. (8th). | S.E. by S. | 4 p.m. (8th). | S.E. by E. | 45 | 2 | 7 p.m. (8th) | E. by N. | 6 | 5 p.m. (8th). | E.S.E. | 50 | |
| | Midnt. (8th). | N.W.byW. | Midnt. (8th). | N.W.byW. | 53 | 7 | 9 a.m. (9th) | W. by S. | 9 | 1 & 2 a.m. (9th). | W.N.W. | 66 | — |
| Stonyhurst | 5 a.m. (9th). | W.N.W. | — | — | — | — | 8 a.m. (9th) | W.N.W. | 3 | 6 a.m. (9th). | W.N.W. | 39 | — |
| Moorside (Halifax). | 5 a.m. (9th). | N.W.byW. | — | — | — | — | Noon (9th) | N.W.byW. | 7 | 7 a.m. (9th). | N.W. | 40 | — |
| Alnwick Castle. | 4 a.m. (8th). | W. by S. | 5 a.m. (8th). | W. by S. | 42 | 4 | 1 p.m. (8th) | S.W.byW. | 9 | 9 a.m. (8th). | W. by S. | 43 | |
| | Midnt. (8th). | E.N.E. | — | — | — | — | 3 a.m. (9th) | N. by E. | 3 | 1 a.m. (9th). | N.E. by E. | 32 | — |
| Kew | 5 p.m. (8th). | S. by E. | 7 p.m. (8th). | S.S.W. | 46 | 6 | 6 a.m. (9th) | S.W.byW. | 13 | 9 p.m. (8th). | S.W. by S. | 52 | — |
| Yarmouth | 6 p.m. (8th). | S.S.W. | 7 p.m. (8th). | S. | 42 | 19 | 3 p.m. (9th) | W. by N. | 21 | 8 p.m. (8th). | S. by E. | 50 | — |

It will be observed that in this case the greatest violence of the gale was felt at the southern stations, whereas in the storm of Nov. 22–23 the maximum velocity was registered at Holyhead. In the present instance the centre of the depression passed to the southward of Holyhead, and the modified gradients on its northern side gave a lighter wind there. In the rear of the storm temperature fell somewhat, and the wind, after blowing hard from W. or N.W., became light. Between this time and 8 a.m. on the 9th the depression passed over England to our north-east coast. The violence of the gale was very great over all the southern parts of the British Isles and the north-west of France. Rain fell in large quantities on our north-west coasts, snow in the north of England, and thunderstorms occurred at the entrance of the English and St. George's Channels.

Dec. 9. The centre of the depression now lay a little to the eastward of the Yorkshire coast, off Scarborough, where the barometer had fallen about 0·8 in. (*see* Fig. 78, Plate LXIX.). The lowest readings were about 28·5 ins. The gradients from Cape Gris Nez to Yarmouth and from Liverpool to Scarborough were 0·18 in. per 50 miles. A northerly gale was now blowing at Shields, fresh westerly gales over western and central England, and strong south-west gales over Belgium and the Netherlands, drawing into south in Denmark, while at Valencia there was a north-west gale. In Norway the wind was easterly. Temperature fell considerably in Scotland; but the weather improved in the south, and the rainfall during the day was comparatively small in other places. A brilliant auroral display was seen at the Scotch stations in the evening; lightning at Dover. Hail showers prevailed all day at Valencia, and in the afternoon at Stonyhurst.

Dec. 10. The recovery of pressure from the late serious depression was much interrupted at our south-western stations by the advance of a new storm from the westward towards the mouth of the Channel, producing the disturbances shown in the barograms on this day, in Plate LXIX. Although the effect of this depression as shown in our islands was to reduce, and almost destroy, the gradients for westerly winds, so causing variable airs and calms, the result produced in France was more serious. There the gradients for westerly winds became exceedingly steep as the centre travelled up the Channel, and severe S.W. to W. gales swept over the whole country. Temperature decreased generally; the weather remained fine in Scotland, and though some rain fell in most other parts of our islands, it was slight when compared with what fell in France and the Straits of Dover during the day. By 6 p.m. the disturbance had reached Cape Gris Nez, and northerly to easterly breezes prevailed throughout our islands, increasing in strength and "backing" a little as the centre moved eastwards and the barometer rose. At Yarmouth a velocity of 44 miles an hour from E.N.E. was reached by 9 p.m. Showers of hail and snow fell very generally with the northerly wind. A lunar halo was seen at Aberdeen in the evening.

Dec. 11. The disturbance had reached the mouth of the Elbe (Fig. 79, Plate LXIX.), and an exceedingly rapid recovery of pressure was in progress throughout the United Kingdom, while in France pressure was giving way. Moderate to strong northerly breezes were general, rising to above 40 miles an hour at Holyhead early in the morning, and at Yarmouth in the afternoon, and drawing into W. over the Bay of Biscay; while strong south-westerly breezes were felt in the north of Spain and a light S.S.W. wind at Cuxhaven. Temperature nevertheless rose on most of our coasts, but fell in the Channel and France. Further falls of snow and hail occurred in the N. and E.

Dec. 12. The rise of the barometer had continued generally, very rapidly in the east. Readings ranged about 30 ins. over Ireland, England, and the north of France, but decreased from thence to 29·6 ins. in the south of France and 29·4 ins. in Norway. The depression above mentioned had disappeared. Moderate to fresh N.W. winds prevailed over the North Sea (rising to 45 miles an hour at Sandwick by 10 a.m.), and northerly winds in France, while variable airs and calms were reported in the United Kingdom. Temperature fell everywhere and was very low in Great Britain, but the weather was fine, though at the northern stations showers of snow continued to fall. During the day, however, pressure again began to give way in the west, while it rose in the south of France; temperature increased very rapidly, and the wind shifted quickly to the southward on all our coasts. A lunar halo was again seen at Aberdeen.

Dec. 13. The barometer stood 0·4 in. lower in the extreme north-west of our islands at 8 a.m. than it had done 24 hours previously, while on the continent the opposite change had occurred—especially in France. A depression lay off the north-west of Scotland, and apparently some minor disturbances had been formed over the North Channel and Irish Sea. The winds were west-north-westerly in Ireland, west-south-westerly in the west of France, and south-westerly or southerly in Great Britain, but were light generally. In Denmark fresh westerly breezes were reported, and light airs in the south of Norway. Temperature had increased considerably except on the eastern shores of the North Sea, though it was still low over Great Britain and central France. Rain, which had again set in at our western stations, soon extended over the whole of England, with snow at Aberdeen. During the day the north-western depression passed off and a new fall commenced at Valencia about noon. At night lunar halos were seen in several places, aurora at Nottingham.

Dec. 14. The conditions shown at 8 a.m. were very complicated, (*see* Fig. 80, Plate LXX.) The mercury had fallen at nearly all stations. The western edge of a shallow depression was lying over Denmark, a new disturbance had advanced to the mouth of St. George's Channel, while a third, very shallow one, was found between Holland and the mouth of the Thames. Temperature rose rapidly in France, accom-

panied by a S.W. gale, but changed irregularly elsewhere. Light to fresh easterly breezes were felt in the west of our islands, northerly winds on the Danish coast and in the south-east of England. Rain fell except in the north, very heavily in the west of France, and a great deal of fog was experienced off our north-east coasts. In the evening strong magnetic disturbances occurred at Aberdeen, and a lunar halo was seen at Shields.

By 8 a.m. on the 15th the south-western disturbance, which was rapidly becoming filled up, lay over Cornwall and Devonshire, it will be seen that there is no trace of its passage on the Kew barogram. The other two depressions had disappeared; and the south-western portion of an anticyclone appeared in Norway, where temperature fell. The winds had become very light, though the circulation round the low pressure was complete. Temperature rose in most parts of our islands, and the weather became very foggy and gloomy, while it remained showery.

Dec. 16. At 8 o'clock barometrical pressure slightly exceeded 30 ins., both in the south of Norway and south-west of France, while on our east coast it was about 29·85 ins. A shallow area of low pressure lay over Holland, and on our north-west coasts also the barometer stood below 29·7 ins.* Southerly winds and increased temperature were felt in the west and north of the United Kingdom, while colder weather was experienced in Norway and the east of England. Rain had been general. The sky was still overcast except in the south-east, and the weather was extremely unsettled. A rather sudden fall of the barometer now took place, the change being felt first in the south-west and south of England, and by 6 p.m. a rather large and deep depression had advanced on our south-west coasts (*see* Fig. 81). Moderate to fresh S. or S.S.E. gales at once set in at Pembroke and on our north-east coast, while a strong W.S.W. breeze was felt at Scilly. The disturbance continued to move north-eastwards. Heavy rain fell in the south, accompanied by an increase of temperature, and fog in the S.W., while exceedingly heavy snow fell in the north of England, completely interrupting telegraphic communication between the north and south of the kingdom.

Dec. 17. By 8 a.m. the centre of the storm reached Holyhead (Fig. 82, Plate LXXI.), at which time a northerly gale was blowing at Valencia, a N.W. gale at the mouth of the Channel, a S.W. gale at Cape Gris Nez, a strong S.E. gale on the Yorkshire coast and at Aberdeen, and a strong easterly wind at Sumburgh Head. The force of the wind was not great except on our east coasts, as will be seen from the following table, but the fall of snow in the north of England was unusually heavy.

* A reference to page 22 will show that these conditions were a reasonably close reproduction of those which prevailed on February 16, 1872 (Fig. 23, Plate X.). The co-existence of two areas of high and two of low pressure over the limited district represented by our charts, is very remarkable. In both cases a gale ensued, but it was more serious on this occasion than in February.

| Observatories. Dec. 16-18, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 4 a.m. (17th). | W. | — | — | — | — | 3 p.m. (17th) | W. by N. | 11 | 11 a.m. (17th). | W. | 35 | — |
| Aberdeen | 4 p.m. (16th). | S.S.E. | 6 p.m. (16th). | S.S.E. | 43 | 6 | 10 a.m. (18th) | E.S.E. | 42 | 7, 8, and 9 p.m. (16th). | S.S.E. | 45 | — |
| | | | Noon (17th). | E.S.E. | 42 | 3 | | | | | | | |
| | | | 4 a.m. (18th). | E.S.E. | 42 | 3 | | | | | | | |
| Sandwick | Noon (16th). | S.S.E. | 8 p.m. (16th). | S.E. by S. | 42 | 7 | 9 a.m. (17th) | S.E. by E. | 21 | 10 p.m. & Midnight (16th). | S.E. by S. | 44 | — |
| Falmouth | 7 p.m. (16th). | S.W. by S. | 8 a.m. (17th). | W. by N. | 42 | 10 | 1 a.m. (18th) | W.N.W. | 30 | 11 a.m. and noon (17th). | W. by N. | 44 | — |
| Holyhead | 8 p.m. (16th). | E. by N. | — | — | — | — | 2 a.m. (17th) | E.N.E. | 6 | 11 p.m. (16th). | E.N.E. | 43 | For one hour only. |
| | 6 a.m. (17th). | W. | 8 a.m. (17th). | W.N.W. | 46 | 14 | 3 a.m. (18th) | N.N.W. | 21 | 1,2,&4p.m. (17th). | N.W.byW. | 50 | — |
| Alnwick Castle | 8 p.m. (16th). | S.S.E. | 5 a.m. (17th). | S.E. by E. | 41 | 6 | 6 p.m. (17th) | E. | 22 | 8 a.m. (17th). | E.S.E. | 44 | — |
| Yarmouth | 5 p.m. (16th). | S.E. by E. | 8 p.m. (16th). | S.E. | 49 | 11 | 7 a.m. (17th) | S. | 14 | 2 & 3 a.m. (17th). | S.E. by E. | 62 | — |

At Stonyhurst and Halifax 30 miles an hour was scarcely exceeded in this gale, which was felt in those places from the eastward. The centre seems now to have changed its course and moved east-south-eastwards, so that the recovery of pressure in the south was very much retarded. In fact, there can be little doubt that a further fall would have resulted at Kew from this change had not the depression itself begun to be filled up as it moved in its new direction.

Dec. 18. The disturbance now lay over Norfolk, Suffolk, and Cambridgeshire. The circulation of wind round it continued (except in the south of Ireland), and though in our islands the wind had moderated, south-easterly to north-easterly gales were still felt in Denmark and the south of Norway (*see* Fig. 83), while an exceedingly heavy sea came in at Wick. On looking at Plate LXXI., however, we find that a new fall of the barometer had already commenced at Valencia, bringing about a return of S. and S.E. breezes to Ireland, and an increase of easterly wind in the north. Rain again fell in most parts of the kingdom, and great floods occurred in the north.

Dec. 19. The depression of the past few days had disappeared, but the eastern portion of a large shallow one had advanced over Ireland, throwing out an arm over the Bristol Channel and Dorsetshire (Fig. 84, Plate LXXI.). Very variable airs were now felt in the west and south; but as gradients were still steep over the North Sea south-easterly gales were still felt in Denmark and the east of Scotland, attaining the velocity of 40 miles an hour at Aberdeen and Sandwick during the morning, while a

N.E. gale was reported from Oxö. Temperature remained remarkably steady at the northern observatories (Plate LXXI.), and though it varied several degrees elsewhere the changes were of a very transitory character except in the south-east, where it continued to rise from midnight of the 18th to noon of the 21st—*see* the Kew curve. The weather was wet and exceedingly unsettled. The barometer had been rising slowly in the south of Ireland since 10 p.m., 18th, but shortly before noon of to-day a new fall heralded the approach of further bad weather from the Atlantic.

The general condition of pressure and the gales reported at 8 a.m. on the 20th, are shown in Fig. 85, from which it will be seen that the new depression was then lying off the south-west of Ireland, and that its steepest gradients were those for S.E. winds, lying over our western coasts. It would appear from the following table that the wind rose to above 30 miles an hour simultaneously at Aberdeen and Falmouth; but at Holyhead (which lies almost directly between the two observatories, and usually feels the wind so quickly) it did not do so until 11 hours later, and even then this station did not feel nearly so strong a wind as either of the others.

| Observatories, Dec. 20, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 1 a.m. (20th). | E. | — | — | — | — | 1 p.m. (20th) | E. | 12 | 7 a.m. (20th). | E.N.E. | 39 | — |
| Aberdeen | 3 a.m. (20th). | S.S.E. | 7 p.m. (20th). | S.E. | 42 | 5 | 4 p.m. (21st) | S.E. by E. | 37 | 10&11 p.m. (20th). | S.E. | 43 | — |
| Sandwick | 10 p.m. (19th). | S.E. | — | — | — | — | 2 p.m. (20th) | S.E. by E. | 16 | 9 a.m. (20th). | S.E. | 37 | Wind increased to a velocity of 30 miles two or three times subsequently on the 20th, and 21st. |
| Falmouth | 3 a.m. (20th). | S.S.E. | 5 a.m. (20th). | S.S.E. | 46 | 7 | 7 p.m. (20th) | S. by E. | 16 | 8 a.m. (20th). | S.E. by S. | 53 | — |
| Holyhead | 1 p.m. (20th). | E. | — | — | — | — | 3 a.m. (21st) | E. | 14 | 1,2,&3 p.m. (20th). | E. | 35 | — |

At Yarmouth 30 miles an hour from S.E. was reached several times during this and the following day, but nothing above 32 miles an hour was registered. This gale does not appear to have been by any means general, except in the Irish Sea and St. George's Channel. Rainy weather continued, and lightning was seen at Roche's Point.

Dec. 21. The centre of the storm had advanced well over the south of Ireland, and gradients in our islands became slight except in the north and east, while, owing to a slight rise both in Norway and over the Mediterranean, gradients became steeper over the North Sea and France (Fig. 86). Strong south-easterly winds and gales were still felt on the eastern coasts, but variable airs in the south of Ireland, and fresh

south-westerly winds over the Bay of Biscay. From the curves in Plate LXXI. it is evident that the mercury was now rising generally, and during the day the disturbance seems to have moved off towards north-west. In the early morning a marked gyration of the wind took place at Valencia, accompanied by great oscillation of temperature; and it is to be observed that *though the thermometer fell very much as the wind "backed" from N. to S., it rose again as it continued to back towards E.*, which point it reached about noon. Then, too, the barometer ceased to rise.

Dec. 22. At 8 o'clock pressure ~~veered~~ from 30·25 ins. in the south of Norway and 30·16 ins. at Lyons to 29·48 ins. at Valencia, and the mercury was almost steady after having risen considerably everywhere. Fresh southerly breezes prevailed on our south-west coasts, drawing into a strong south-east breeze in the north and north-west; while E. to N.E. winds were experienced on the eastern shores of the North Sea, blowing a gale at Oxö. The weather was still overcast and rainy. During the day the northern pressures gave way, while those in the south rose, and in the afternoon, when the mercury began to fall in Ireland also, southerly gales were felt in the west and north, as will be seen by the following statement.

| Observatories, Dec. 22-23, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | Midnt. (21st). | S.E. | 3 a.m. (22nd). | S.E. by S. | 46 | 9 | 10 a.m. (23rd) | S.E. by S. | 34 | 9 p.m. (22nd). | S.E. by S. | 51 | — |
| | | | 4 p.m. (22nd). | S.E. by S. | 47 | 11 | | | | | | | |
| Aberdeen - | 11 p.m. (21st). | S.E. | — | — | — | — | 9 p.m. (22nd) | S.S.E. | 22 | 9 a.m. (22nd). | S.E. by S. | 37 | — |
| Sandwick - | 9 a.m. (22nd). | E.S.E. | 7 p.m. (22nd). | S.E. by E. | 42 | 6 | 4 a.m. (23rd) | S. by E. | 19 | 10 p.m. (22nd). | S.E. by E. | 44 | — |
| Falmouth - | 4 a.m. (23rd.) | S. by W. | — | — | — | — | 4 p.m. (23rd) | S. by W. | 12 | 9 a.m. (23rd). | S. by W. | 39 | — |
| Holyhead - | 10 a.m. (22nd). | S.S.E. | 7 p.m. (22nd). | S. by E. | 44 | 18 | 7 p.m. (23rd) | S. | 33 | Midnight (22nd). | S. by E. | 50 | — |

Temperature rose everywhere as the wind became southerly.

Dec. 23. The barometer now stood highest in Germany and over the Baltic, and lowest off the west-north-west of our islands (*see* Fig. 87, Plate LXXII.), the intervening gradients being steep, especially in the west. The weather was mild, except in Norway, and comparatively fine at the southern stations. Little recovery of pressure occurred from the fall noticed in the north and west yesterday, and strong southerly winds were still felt in those regions, with south-easterly breezes in Norway. Temperature had risen in the west, where rain fell, but decreased a little in the east and south-east, with finer weather. Scarcely any change of importance occurred in

pressure till nearly midnight, when the mercury again began to descend rapidly at Valencia, and the fall soon made itself felt on our other coasts.

At 8 a.m. on the 24th we find there was another deep depression lying off Valencia, where the barometer had fallen half an inch (Fig. 88), while the previous decrease had passed on to Norway, and caused a fall of about 0·6 in. in that country. The reading at Valencia was now 28·69 ins., and by midday it decreased to 28·5 ins. Gradients for southerly winds became very steep, and fresh to strong southerly gales set in on nearly all our coasts, commencing first in Ireland and St. George's Channel, where its force was greatest.

| Observatories, Dec. 24-25, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 4 a.m. (24th). | E. by S. | 9 a.m. (24th). | E.S.E. | 46 | 9 | 7 p.m. (24th) | S.S.E. | 15 | 2 p.m. (24th). | S. | 52 | — |
| | 5 a.m. (25th). | S.E. by S. | — | — | — | — | 11 a.m. (25th) | S. by E. | 6 | 9 a.m. (25th). | S. | 40 | |
| Armagh | 11 a.m. (24th). | S.S.E. | — | — | — | — | 6 p.m. (24th) | S. by W. | 7 | 4 p.m. (24th). | S.S.E. | 38 | — |
| Falmouth | 6 a.m. (24th). | S. by E. | 11 a.m. (24th). | S. by E. | 44 | 11 | 5 a.m. (25th) | S. | 23 | 5 p.m. (24th). | S. by W. | 46 | — |
| Holyhead | 2 a.m. (24th). | S. by E. | 10 a.m. (24th). | S.S.E. | 46 | 24 | Midnight (25th). | S.W. | 46 | 6 p.m. (24th). | S.S.E. | 55 | — |
| | | | 3 p.m. (25th.) | S. | 42 | 7 | | | | | | | |
| Stonyhurst | 6 p.m. (24th). | S. by E. | — | — | — | — | 11 a.m. (25th.) | S. by W. | 17 | 6 & 9 p.m. (24th). | S. by E. | 33 | — |

At Armagh, Glasgow, Moorside, and Alnwick Castle strong southerly breezes were felt, but not exceeding 35 miles an hour in velocity, while at Yarmouth the force was still less. The weather became rather colder in most parts of our islands, but much warmer on the eastern shores of the North Sea, and slightly so in the Channel and west of France. Rain extended to all but our north-east coasts.

Dec. 25. The depression of yesterday was travelling northwards and now lay off the Hebrides (Fig. 89), so that while fresh to strong southerly breezes were felt generally, the only gales reported, excepting that at Biarritz, were those in the north. At the last-named station, however, the force is probably exaggerated. Temperature again rose in the south-east and over France; and during the day a rapid recovery of pressure set in generally, with improved weather. In Scotland the recovery did not commence till midnight. Lightning was seen at Roche's Point in the evening and aurora at Stonyhurst and in the Orkneys.

Dec. 26. The barometer had risen 0·7 in. in the south of Ireland and less elsewhere, so that the isobaric curves lay nearly W. and E. over the north of our islands, and turned

north-eastwards over the North Sea. The wind had veered considerably in the west and north of Great Britain, while the S.S.W. breezes had moderated at the more eastern stations; but in Ireland a "backing" to the southward had again taken place. Temperature had fallen very generally in the night, but only temporarily, and the weather became rather finer. In the morning, however, a fresh and unsteady fall of the barometer commenced in the west, and, though slight, made itself felt during the day at all the observatories. Aurora was again seen at Sandwick during the evening.

Dec. 27. Fig. 90, Plate LXXIII., shows the general condition of pressure, and the gales reported at 8 a.m. From this it appears that a very extensive area of low pressure lay to the west-north-westward of our islands. The gradual nature of the changes which occurred owing to this depression, the rate of fall and subsequent rise in the barometer, and the form of the isobars, tend to show that the track of the centre lay at a great distance from our coasts; though owing to the continued rise of the mercury in the south-east for several hours after the western barometers began to fall, gradients for southerly winds became very steep in our islands, and strong gales occurred on our western coasts.

| Observatories. Dec. 26-28, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia | 11 a.m. (26th). | S.S.E. | 2 p.m. (26th). | S.E. by S. | 51 | 18 | 9 a.m. (27th) | S.S.E. | 22 | 4 p.m. (26th). | S.S.E. | 59 | — |
| Armagh | 7 p.m. (26th). | S. by W. | — | — | — | — | 10 a.m. (27th) | S. | 15 | 5 a.m. (27th). | S. | 41 | For one hour only. |
| Glasgow | 11 p.m. (26th). | S. | — | — | — | — | 8 a.m. (27th) | S. by E. | 9 | 3 & 5 a.m. (27th). | S. | 35 | — |
| Sandwick | 10 p.m. (26th). | S. | — | — | — | — | 7 a.m. (27th) | S. by E. | 9 | 3 a.m. (27th). | S. | 37 | — |
| Falmouth | 7 p.m. (26th). | S. by W. | 9 a.m. (27th). | S. | 46 | 12 | 2 a.m. (28th) | S. by W. | 31 | 11 a.m., to 1 p.m. (27th). | S. by E. | 50 | — |
| Holyhead | Noon (26th). | S. by W. | 5 p.m. (26th). | S. by E. | 51 | 32 | 6 a.m. (28th) | S. by E. | 42 | 9 a.m. (27th). | S. by E. | 60 | — |
| Stonyhurst | 4 a.m. (27th). | S. | — | — | — | — | 5 a.m. (28th) | S. by E. | 25 | 9 a.m. (27th). | S. by W. | 38 | — |

At Moorside, too, strong breezes were felt on the 27th. Temperature rose considerably in the north and west as the southerly winds set in, but in the south-east the weather was fine though densely foggy for a time in some localities, and rather colder than of late. In the afternoon the Irish barometers began to rise fast.

Dec. 28. The barometer was rising fast throughout the west and north of our islands from the fall noticed there yesterday, though the recovery had not yet extended to our

south and south-east stations; and in the meantime pressure began to give way in France. The form of the isobars over our south-western stations, the distinct retardation of the recovery at Falmouth, and the veering of the wind there to N. and N.W., in the manner shown on Plate LXXIII., point to the advance of some shallow disturbance towards the mouth of the Channel, producing calms and variable airs on our south-west coasts, but strong southerly breezes in the Bay of Biscay, and rain in the north-west of France. Temperature continued to fall in Ireland and Scotland. The sky was very cloudy generally; and later on, as the disturbance moved eastwards, rain fell in all parts of England, but Scotland and Ireland escaped. In the afternoon pressure was increasing everywhere.

Dec. 29. The rise of the barometer having been much more rapid in the west than over England, while very little fall had taken place over the North Sea, the conditions presented at 8 a.m. were of a very peculiar kind. Pressure was actually lowest in the north; but a singular arm of low readings extended thence in a southerly direction over England and the north and west of France. Thus while moderate N. and N.W. winds prevailed at all the western and south-western stations, light southerly breezes were reported in the east of France, the east of England, and over the North Sea, but blowing freshly at both Fanö and Skudesnaes. Temperature again fell except in the south-east, where no change occurred until later in the day. The sky became much clearer in the west, and subsequently the weather improved generally. In the evening, however, the barometer attained its maximum in Ireland and began to fall again. During the night lightning was observed, and a sharp frost occurred in Scotland; thunder was reported at Holyhead.

Dec. 30. The arm of low pressure noticed yesterday had travelled north-eastwards, but owing to the sudden reduction of pressure over Ireland, the general distribution of pressure was rapidly settling down to that of high readings over Germany and the south-east of France, with low ones off our north-west coasts. Southerly breezes had taken the place of the northerly ones in the west, while variable airs prevailed in the east. As the day advanced the barometrical fall and southerly winds, with increased temperature, and rain, extended eastwards.

Dec. 31. The conditions which had become established by 8 a.m. are shown in Fig. 91, Plate LXXIII., when the gradient from Brussels to Holyhead was 0·07 in., while that from Holyhead to Greencastle was 0·05 in., per 50 miles. Strong southerly breezes, which had reached the force of a gale in the west during the night, prevailed generally.

| Observatories. Dec. 30-31, 1872. | Velocity, 30-40 Miles per Hour. | | Velocity Exceeding 40 Miles per Hour. | | | | Velocity Fell below 30 Miles per Hour. | | Total No. of Hours the Vel. above 30 Mls. | Maximum Velocity. | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Commenced. | Direction of Wind. | Commenced. | Direction of Wind. | Mean Vel. | Duration in Hours. | Ended. | Direction of Wind. | | Hour. | Direction of Wind. | Velocity. | |
| Valencia - | Midnt. (29th). | S.E. by S. | 6 a.m. (30th). | S. by E. | 43 | 9 | 4 p.m. (30th) | S. by E. | 16 | 1 p.m. (30th). | S. by E. | 48 | — |
| Falmouth - | 7 p.m. (30th). | S. by W. | Midnt. (30th). | S. by W. | 45 | 2 | 3 a.m. (31st) | S.W. by S. | 8 | 1 a.m. (31st). | S. by W. | 46 | — |
| Holyhead - | 1 p.m. (30th). | S.S.E. | 6 p.m. (30th). | S.S.E. | 46 | 12 | 7 p.m. (31st) | S. by W. | 30 | 2 a.m. (31st). | S.S.E. | 53 | — |
| Stonyhurst - | 4 a.m. (31st). | S.S.E. | — | — | — | — | 8 a.m. (31st) | S. by W. | 4 | 5 a.m. (31st). | S.S.E. | 40 | — |

Yarmouth experienced a maximum velocity of 31 miles an hour from S. by W. at 11 a.m. The year closed with very unsettled weather, and remarkably uniform temperature over the United Kingdom. Aurora was seen in Scotland.

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## Remarks.

We now come to the consideration of the usual tables given at the end of these reports, the following being drawn up in a manner precisely similar to those given in the earlier parts:—

| Observatory. | Oct. | Nov. | Dec. | Total. | Observatory. | Oct. | Nov. | Dec. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| Valencia - - | 115 | 232 | 186 | 533 | Holyhead - | 234 | 379 | 313 | 926 |
| Armagh - - | 0 | 24 | 27 | 51 | Stonyhurst - | 3 | 41 | 60 | 104 |
| Glasgow - - | 22 | 50 | 29 | 101 | Halifax (Moorside) | 5 | 61 | 32 | 98 |
| Aberdeen - - | 47 | 56 | 145 | 248 | Alnwick Castle - | 64 | 96 | 73 | 233 |
| Sandwick - - | 110 | 139 | 153 | 402 | Kew - - - | 1 | 50 | 14 | 65 |
| Falmouth - - | 103 | 207 | 167 | 477 | Yarmouth - - | 57 | 164 | 90 | 311 |

We find that the most windy months in this stormy quarter were, November for the west, south, and east coasts, and December for the north. At Holyhead for about two fifths of the whole quarter the velocity exceeded 30 miles an hour, and in November considerably more than half the hours had similar velocities registered in them. Windy as the first quarter of the year was, this last quarter was far more so. In fact, no other quarter since the year 1869 had nearly so many hours of strong wind as this one.

The next table shows the total number of hours in the whole year during which winds of 30 miles in the hour, or upwards, were experienced.

| | | | |
|---|---|---|---|
| Valencia | 1,709 | Holyhead | 2,466 |
| Armagh | 121 | Stonyhurst | 230 |
| Glasgow | 258 | Halifax (Moorside) | 202 |
| Aberdeen | 533 | Alnwick Castle | 530 |
| Sandwick | ? 1,256 | Kew | 135 |
| Falmouth | 1,190 | Yarmouth | 560 |

Of these values, those for the western and southern observatories and for Sandwick were exceeded in the year 1869, but not since; while at Aberdeen there were more strong winds in this year than in either of the three preceding ones.

As usual, Holyhead had the greatest number, about 3 per cent. of the hours of the whole year having brought winds of 30 miles an hour or more to that exposed station, while the inland stations of Armagh and Kew had only about one twentieth of that amount of high wind.

### *Pressure.*

The following are the tables showing the mean and extreme values, with the range for each month and for the whole year, the readings being all reduced to 32° F. at mean sea level.

October.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ins. | ins. | ins. | | ins. | | ins. |
| Valencia | 29·693 | −0·227 | 30·372 | 5th, 8 & 9 a.m. | 28·594 | 25th, 3 a.m. | 1·778 |
| Armagh | 29·649 | −0·161 | 30·377 | 5th, 10 a.m. | 28·952 | 24th, 5 & 6 p.m. | 1·425 |
| Glasgow | 29·613 | −0·167 | 30·346 | 5th, 9 & 10 a.m. | 29·024 | 24th, 7 a.m. | 1·322 |
| Aberdeen | 29·574 | −0·211 | 30·330 | 5th, 10 a.m. | 29·018 | 30th, 11 p.m.<br>31st, 5 & 6 a.m. | 1·312 |
| Falmouth | 29·718 | −0·195 | 30·363 | 6th, 9 & 10 p.m. | 29·043 | 25th, 2 p.m. | 1·320 |
| Stonyhurst | 29·651 | −0·165 | 30·343 | 6th, 8 a.m. | 29·016 | 10th, 9 p.m. | 1·327 |
| Kew | 29·718 | −0·177 | 30·389 | 6th, 10 p.m. | 29·194 | 24th, 11 p.m. | 1·195 |

Pressure was considerably below the average everywhere, the deficiency being most marked at Valencia. At this observatory, too, the greatest range was reported, owing to the very low level reached by the mercury on the 25th, as compared with that at any other observatory. The maximum of the 5th and 6th appears to have been very general, while the minimum of the 24th–25th was exceeded only at Aberdeen and Stonyhurst by depressions felt on other days.

November.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ins. | ins. | ins. | | ins. | | ins. |
| Valencia - - | 29·588 | −0·427 | 30·435 | 10th, 10 pm. | 28·325 | 23rd, 7 a.m. | 2·110 |
| Armagh - - | 29·548 | −0·334 | 30·400 | 12th, 9 p.m. | 28·444 | 23rd, 8 p.m. | 1·956 |
| Glasgow - - | 29·523 | −0·346 | 30·423 | 13th, 11 a.m. | 28·463 | 23rd, 11 p.m. | 1·960 |
| Aberdeen - - | 29·521 | −0·350 | 30·471 | 13th, 9 a.m. | 28·510 | 24th, 1 a.m. | 1·961 |
| Falmouth - - | 29·700 | −0·284 | 30·445 | 7th, 9 p.m. | 28·573 | 30th, 4 & 5 p.m. | 1·872 |
| Stonyhurst - | 29·588 | −0·297 | 30·303 | 12th, 9 p.m. | 28·702 | 30th, midt. | 1·601 |
| Kew - - - | 29·683 | −0·284 | 30·413 | 7th, 10 p.m. | 28·854 | 30th, 11 p.m. | 1·559 |

Pressure was again much below the average, especially in the west and north, although the great deficiency shown at Valencia is probably partially owing to a defect in the average value employed. The highest readings occurred about the middle of the month, except in the south of England, where they took place on the 7th, while the minimum (which was very low) occurred in Scotland and Ireland during the depression of the 23rd–24th, but that in England at the close of the month. The range was everywhere large, very much so at Valencia.

December.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ins. | ins. | ins. | | ins. | | ins. |
| Valencia - - | 29·442 | −0·372 | 30·084 | 4th, 11 a.m. | 28·508 | 24th, 2 p.m. | 1·576 |
| Armagh - - | 29·474 | −0·410 | 30·051 | 4th, 11 a.m.<br>12th, 10 a.m. | 28·630 | 25th, 6 & 7 a.m. | 1·421 |
| Glasgow - - | 29·468 | −0·348 | 29·991 | 4th, 11 a.m. | 28·663 | 25th, 8 a.m. | 1·328 |
| Aberdeen - - | 29·492 | −0·336 | 29·986 | 22nd, 3 a.m. | 28·721 | 25th, 10 a.m. | 1·265 |
| Falmouth - - | 29·568 | −0·496 | 30·071 | 4th, noon | 28·917 | 25th, 3 & 5 a.m. | 1·154 |
| Stonyhurst - - | 29·519 | −0·343 | 29·999 | 4th, 9 & 10 p.m. | 28·465 | 8th, midnt. | 1·534 |
| Kew - - - | 29·604 | −0·428 | 30·039 | 5th, 9 a.m. | 28·803 | 10th, 6 p.m. | 1·236 |

The barometer was below the average in all places, and at some stations even to a greater extent than in either of the two preceding months. At Falmouth the deficiency was nearly half an inch. The highest readings were below 30 ins. in the north of Great Britain, and scarcely above that value elsewhere. The minimum readings were low in the north, and the range was everywhere considerable.

The next table gives the mean and extreme values for the whole year, together with the difference between the means, and the averages for a considerable series of years, as before.

For the whole Year.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ins. | ins. | ins. | | ins. | | ins. |
| Valencia - | 29·736 | −0·179 | 30·462 | May 26th, 10 p.m. | 28·325 | Nov. 23rd, 7 a.m. | 2·137 |
| Armagh - | 29·729 | −0·136 | 30·419 | May 10th, 11 p.m. | 28·271 | Jan. 18th, 1 a.m. | 2·148 |
| Glasgow - | 29·704 | −0·125 | 30·420 | Nov. 13th, 11 a.m. | *28·291 | Jan. 18th, 1 a.m.? | 2·129? |
| Aberdeen - | 29·703 | −0·139 | 30·471 | Nov. 13th, 9 a.m. | 28·169 | Jan. 18th, 8 a.m. | 2·302 |
| Falmouth - | 29·822 | −0·177 | 30·512 | April 6th, 9 p.m. | 28·419 | Jan. 23rd, mdnt. | 2·093 |
| Stonyhurst - | 29·751 | −0·126 | 30·501 | April 6th, 7 a.m. | 28·431 | Jan. 24th, 8 a.m. | 2·070 |
| Kew - - | 29·821 | −0·137 | 30·514 | April 6th, 10 a.m. | 28·346 | Jan. 24th, 5 a.m. | 2·168 |

* Doubtful, trace not visible for next eight hours.

Pressure was therefore very much below the average for the year in all parts of the kingdom, the smallest departures being at Glasgow and Stonyhurst. The highest pressures occurred in England on April 6th, in Ireland during May, and in Scotland on November 13th; while the lowest took place on January 24th in England, January the 18th in Scotland and the north of Ireland, but on November 23rd at Valencia. The range was much greater in Scotland than elsewhere, owing to the very low readings registered there on the 18th of January, on which occasion, unhappily, the trace failed at Glasgow for several hours.

*Temperature.*— October.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 49·6 | −3·3 | 58·1 | 7th, 6 a.m. | 38·0 | 5th, 6 a.m. | 20·1 |
| Armagh - - | 45·4 | −3·8 | 58·9 | 1st, 2 p.m. | 31·3 | 5th, 6 a.m. | 27·6 |
| Glasgow - - | 45·9 | −1·6 | 57·6 | 1st, 1 p.m. | 28·3 | 5th, 8 a.m. | 29·3 |
| Aberdeen - - | 46·6 | +0·3 | 57·8 | 2nd, 2 p.m. | 33·3 | 5th, 6 a.m. | 24·5 |
| Falmouth - - | 50·1 | — | 61·6 | 2nd, 1 p.m. | 40·5 | 14th, 7 a.m. | 21·1 |
| Stonyhurst - - | 46·3 | −1·9 | 58·8 | 2nd, 2 p.m. | 30·6 | 15th, 7 a.m. | 28·2 |
| Kew - - - | 48·0 | −1·9 | 63·5 | 2nd, 3 p.m. | 30·2 | 14th, 6 a.m. | 33·3 |

Excepting at Aberdeen, temperature was everywhere below the average, most in Ireland, where the deficiency exceeded 3°. The maximum temperature was recorded on the 1st or 2nd at all stations except Valencia, where it took place on the 7th at the very unusual hour of 6 a.m.; and the highest readings of all occurred in the south of England. The greatest cold was recorded in Ireland and Scotland on the 5th, during the prevalence of the anticyclone of that period, while in England the thermometer fell lowest on the 14th or 15th. The range was greatest at Kew.

## November.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 46·9 | +0·1 | 59·0 | 6th, noon | 32·2 | 14th, 8 a.m. | 26·8 |
| Armagh - - | 42·6 | +0·2 | 61·6 | 6th, 1 p.m. | 30·0 | 25th, 7 a.m. | 31·6 |
| Glasgow - - | 42·0 | +1·7 | 59·8 | 6th, 2 p.m. | 29·8 | 19th, 10 a.m. | 30·0 |
| Aberdeen - - | 43·1 | +3·2 | 61·0 | 6th, 3 p.m. | 31·2 | 28th, 8 a.m. | 29·8 |
| Falmouth - - | 47·9 | — | 57·3 | 6th, 11 a.m. | 36·5 | 13th, 8 a.m. | 20·8 |
| Stonyhurst - - | 43·3 | +2·2 | 60·9 | 6th, 3 p.m. | 27·1 | 19th, 8 a.m. | 33·8 |
| Kew - - - | 45·8 | +3·6 | 60·1 | 5th, 11 a.m. | 32·5 | 18th, 3 a.m. | 27·6 |

During November the weather was warm and close, especially in Great Britain. The thermometer rose to its maximum height at Kew on the morning of the 5th, but at all the other observatories it took place on the following day. The various minima, however, were registered on very different dates. Those at our most south-western observatories being felt on the 13th or 14th, while Kew, Stonyhurst, and Glasgow had theirs on the 18th or 19th, at the two stations last named being lower than those of any other station, except that at Armagh on the 25th. In consequence of this we find that the range was greatest in the north-west instead of at Kew, as is so often the case.

## December.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 46·3 | 0·0 | 54·0 | 22nd, noon | 33·4 | 12th, 7 a.m. | 20·6 |
| Armagh - - | 40·2 | −1·2 | 52·4 | 22nd, 1 p.m. | 27·9 | 12th, 9 a.m. | 24·5 |
| Glasgow - - | 39·1 | −1·0 | 51·1 | 27th, 6 a.m. | 25·6 | 12th, 7 a.m. | 25·5 |
| Aberdeen - - | 39·3 | +0·8 | 49·2 | 27th, 5 p.m. | 26·7 | 5th, 7 a.m. | 22·5 |
| Falmouth - - | 46·7 | — | 54·9 | 22nd, 1 p.m. | 34·7 | 12th, 8 a.m. | 20·2 |
| Stonyhurst - - | 40·4 | +0·9 | 50·4 | 22nd, 7 p.m. | 25·6 | 5th, 8 a.m.<br>12th, 4 a.m. | 24·8 |
| Kew - - - | 43·2 | +4·2 | 53·1 | 22nd, 2 p.m. | 29·4 | 12th, 8 a.m. | 23·7 |

The weather was rather warmer than usual in England and the east of Scotland, but rather below the average in Ireland and the west of Scotland. In Ireland and England the warmest weather was experienced just before the serious gale of the 22nd–23rd, while that in Scotland occurred with the gale of the 27th. The coldest weather, on the contrary, appears to have accompanied the lull which took place between the gales on the 12th, except at Aberdeen and Stonyhurst, where the cold then registered was equalled or exceeded on the 5th. The range was not great, and, though smallest in the south-west, was remarkably uniform.

For the whole Year.

| Observatories. | Mean. | Difference from Average. | Maximum. | Day and Hour. | Minimum. | Day and Hour. | Range. |
|---|---|---|---|---|---|---|---|
| | ° | ° | ° | | ° | | ° |
| Valencia - - | 51·2 | +0·1 | 75·5 | Aug. 19th, noon | 31·4 | March 26th, 4 a.m. | 44·1 |
| Armagh - - | 48·1 | −0·8 | 73·6 | July 20th, 2 p.m. | 26·0 | Jan. 21st, 9 a.m. | 47·6 |
| Glasgow - - | 47·3 | +0·2 | 75·1 | June 18th, 2 p.m.<br>July 28th, 4 p.m. | 25·5 | March 26th, 6 a.m. | 49·6 |
| Aberdeen - - | 46·7 | 0·0 | 74·5 | July 4th, 1 p.m.<br>5th, 10 a.m. | 26·7 | Dec. 5th, 7 a.m. | 47·8 |
| Falmouth - - | 51·7 | — | 71·4 | July 21st, 2 p.m. | 32·7 | March 23rd, 6 a.m. | 38·7 |
| Stonyhurst - - | 48·5 | +1·6 | 81·7 | July 21st, 4 p.m. | 22·1 | March 26th, 5 a.m. | 59·6 |
| Kew - - - | 51·0 | +2·2 | 88·6 | July 25th, 3 p.m. | 26·0 | Jan. 15th, 9 a.m. | 62·6 |

The year was, on the whole, slightly warmer in England than the average, but was just about the average in Scotland and Ireland, the warmest stations being those along our southern coasts. The maximum readings (nearly all of which occurred in July) were much higher at Stonyhurst and Kew than at the other observatories; while the mimimum at Stonyhurst was the lowest recorded. Under these circumstances the range at this station was greatly in excess of that at *most* of the others; but Kew (where the maximum on July the 25th reached nearly to 89°) has the very large range of 62°·6. In this respect the difference between the Kew and Falmouth records is very marked. The greatest cold seems to have been felt in the month of March at four out of the seven observatories.

The following is a comparison of the quarterly five-day mean temperatures at Kew with the Greenwich averages—as in former parts of the report.

| Dates. | Variation. | Dates. | Variation. | Dates. | Variation. |
|---|---|---|---|---|---|
| | ° | | ° | | ° |
| Sept. 28–Oct. 2 | +1·2 | Oct. 28–Nov. 1 | +4·3 | Nov. 27–Dec. 1 | +4·3 |
| Oct. 3–7 | −5·6 | Nov. 2–6 | +5·0 | Dec. 2–6 | +0·3 |
| „ 8–12 | −5·6 | „ 7–11 | +0·1 | „ 7–11 | −0·5 |
| „ 13–17 | −5·9 | „ 12–16 | −4·5 | „ 12–16 | +0·3 |
| „ 18–22 | −1·0 | „ 17–21 | +1·0 | „ 17–21 | +2·6 |
| Oct. 23–27 | +1·0 | Nov. 22–26 | +9·3 | „ 22–26 | +11·5 |
| | | | | Dec. 27–31 | +9·1 |

The characteristics shown by this table are as follows:—For the first five days the weather at Kew was rather warmer than the average. A cold period then ensued, lasting the greater part of the month; but between October the 23rd and November 30th the weather was (excepting for a short time in November) warm. From December 2nd to the 16th temperature was about the average; after which it became very warm, and continued so till the end of the year, the five-day mean for the 22nd–26th being nearly 12° too high.

## RAIN.

The next tables give the rainfall for each month in the quarter and that for the whole year. Each of them shows that the amount registered at all stations was excessive.

# RAINFALL, 1872.

| Positions of Gauges. | | | October. | | | | | | | November. | | | | | | | December. | | | | | | | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Names of Stations. | Height of Gauge. Above Ground. | Height of Gauge. Above Mean Sea Level. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Dates. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Dates. | No. of Rainy Days. | Total Fall in the Month. | Difference from the Average. | Greatest Fall in 24 Hours. | Day. | No. of Falls exceeding 1 inch in 24 Hours. | Dates. | |
| **Observatories.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Valencia | ft. in. 2 0 | ft. 11 | 23 | 8·14 | +1·73 | 1·05 | 6th | 1 | 6th | 24 | 6·97 | +0·90 | 0·85 | 29th | 0 | — | 29 | 8·29 | +1·59 | 0·93 | 16th | 0 | — | |
| Armagh | 2 2 | 204 | 19 | 4·20 | +0·96 | 1·00 | 10th | 1 | 10th | 20 | 4·00 | +1·49 | 0·68 | 30th | 0 | — | 19 | 4·67 | −1·89 | 1·38 | 8th | 1 | 8th | |
| Glasgow | 1 10 | 180 | 17 | 3·10 | −1·17 | 0·70 | 29th | 0 | — | 19 | 4·27 | +0·88 | 0·70 | 4th | 0 | — | 20 | 5·39 | +1·28 | 1·07 | 22nd | 1 | 22nd | |
| Aberdeen | 2 0 | 48 | 14 | 4·28 | +1·09 | 1·15 | 11th | 1 | 11th | 22 | 6·36 | +4·35 | 1·57 | 1st | 1 | 1st | 18 | 2·99 | −0·15 | 0·47 | 22nd | 0 | — | |
| Falmouth | 1 10 | 167 | 26 | 7·32 | +3·05 | 1·50 | 30th | 1 | 30th | 25 | 7·03 | +1·83 | 0·81 | 4th | 0 | — | 24 | 7·31 | +3·12 | 1·06 | 27th | 1 | 27th | |
| Stonyhurst | 1 9 | 377 | 26 | 5·88 | +0·58 | 1·56 | 29th | 1 | 29th | 29 | 4·68 | +0·76 | 0·73 | 26th | 0 | — | 28 | 3·77 | −0·81 | 0·73 | 8th | 0 | — | |
| Kew | 1 10 | 20 | 22 | 4·32 | +2·19 | 0·66 | 25th | 0 | — | 22 | 2·97 | +1·24 | 0·33 | 18th | 0 | — | 22 | 3·73 | +2·02 | 0·70 | 16th | 0 | — | |
| **Telegraphic Reporting Stations.** | | | | | | | | | | | | | | | | | | | | | | | | |
| Sumburgh Head (Shetland) | 1 9 | 170 | 22 | 6·44 | +3·65 | 0·76 | 21st | 0 | — | 23 | 4·52 | +1·97 | 0·70 | 6th | 0 | — | 17 | 3·84 | +0·28 | 0·76 | 22nd | 0 | — | |
| Thurso | 1 9 | 25 | 28 | 4·93 | +1·86 | 1·14 | 21st | 1 | 21st | 28 | 4·82 | +1·02 | 0·63 | 30th | 0 | — | 25 | 5·28 | +1·76 | 0·63 | 1st | 0 | — | |
| Wick | 1 9 | 100 | 22 | 2·95 | +0·03 | 1·12 | 21st | 1 | 21st | 25 | 3·17 | +0·41 | 0·54 | 30th | 0 | — | 16 | 2·91 | +0·20 | 0·80 | 1st | 0 | — | |
| Nairn | 1 2 | 44 | 21 | 4·07 | +1·82 | 1·17 | 21st | 1 | 21st | 23 | 4·03 | +2·42 | 0·82 | 1st | 0 | — | 13 | 1·35 | −1·31 | 0·30 | 2nd | 0 | — | |
| Leith | 1 2 | 21 | 16 | 3·64 | +2·37 | 1·07 | 21st | 1 | 21st | 20 | 3·47 | +2·58 | 0·59 | 4th | 0 | — | 16 | 1·74 | +0·14 | 0·63 | 21st | 0 | — | |
| North Shields | 10 0 | 107 | 19 | 4·64 | +1·96 | 1·65 | 10th | 2 | 10th & 21st. | 19 | 3·31 | +1·09 | 0·76 | 15th | 0 | — | 18 | 3·37 | +0·85 | 0·74 | 8th | 0 | — | |
| Scarborough | 1 0 | 130 | 20 | 3·28 | −0·03 | 0·53 | 10th | 0 | — | 20 | 5·59 | +3·32 | 1·03 | 15th | 1 | 15th | 23 | 3·89 | +1·15 | 0·83 | 16th | 0 | — | |
| Yarmouth* | 5 2 / 3 3 | 24 / 11 | 19 | 5·15 | +2·18 | 0·72 | 26th | 0 | — | No observations.* | | | | | | | 20 | 3·31 | −1·30 | 0·71 | 16th | 0 | — | |
| Ardrossan | 1 2 | 13 | 19 | 2·49 | −1·45 | 0·45 | 29th | 0 | — | 21 | 5·44 | +2·02 | 0·89 | 4th | 0 | — | 23 | 5·27 | +0·73 | 0·96 | 22nd | 0 | — | |
| Greencastle | 7 6 | 70 | 27 | 4·65 | −0·31 | 0·61 | 15th & 31st. | 0 | — | 27 | 6·11 | +1·68 | 0·86 | 1st | 0 | — | 28 | 3·77 | −0·34 | 1·09 | 4th | 1 | 4th. | |
| Holyhead† | 9 0 / 1 0 | 24 / 45 | 25 | 10·44 | +6·31 | 1·40 | 1st | 2 | 1st & 7th. | 25 | 6·03 | +3·51 | 0·88 | 23rd | 0 | — | 24 | 7·41 | +3·09 | 0·93 | 8th | 0 | — | |
| Liverpool (Bidston Observatory) | 0 6 | 180 | 23 | 6·39 | +2·19 | 1·02 | 7th | 1 | 7th | 23 | 2·72 | +0·13 | 0·56 | 4th | 0 | — | 21 | 3·55 | +0·34 | 0·76 | 28th | 0 | — | |
| Roche's Point | 1 9 | 23 | 20 | 3·91 | +0·35 | 0·62 | 29th | 0 | — | 22 | 8·53 | +4·90 | 1·04 | 2nd | 1 | 2nd | 23 | 9·24 | +2·75 | 1·02 | 8th | 1 | 8th | |
| Pembroke | 1 2 | 135 | 29 | 5·41 | −0·60 | 0·74 | 16th | 0 | — | 27 | 7·09 | +2·68 | 0·97 | 4th | 0 | — | 27 | 7·12 | +2·14 | 0·90 | 8th | 0 | — | |
| Scilly | 1 9 | 100 | 26 | 5·35 | — | 0·64 | 30th | 0 | — | 26 | 5·27 | — | 1·06 | 22nd | 1 | 22nd | 29 | 5·95 | — | 0·77 | 6th | 0 | — | |
| Plymouth‡ | 10 0 | 75 | 24 | 5·34 | +1·83 | 0·96 | 30th | 0 | — | 26 | 5·22 | +2·21 | 0·76 | 24th | 0 | — | 24 | 5·34 | +0·76 | 0·64 | 27th | 0 | — | |
| Portsmouth | 1 0 | 16 | 21 | 4·13 | +1·62 | 0·70 | 30th | 0 | — | 24 | 4·04 | +2·69 | 0·58 | 27th | 0 | — | 20 | 4·08 | +0·81 | 0·68 | 6th | 0 | — | |
| Dover | 23 0 | 46 | 24 | 4·52 | — | 1·04 | 16th | 1 | 16th | 24 | 9·01 | — | 1·45 | 16th | 1 | 16th | 21 | 5·85 | — | 1·50 | 10th | 2 | 3rd & 10th | |
| London | 1 2 | 73 | 22 | 4·55 | +2·23 | 0·68 | 21st | 0 | — | 22 | 3·20 | +1·75 | 0·41 | 30th | 0 | — | 21 | 3·75 | +0·97 | 0·60 | 16th | 0 | — | |
| **Extra Stations.** (Information supplied by Societies, private individuals, and others.) | | | | | | | | | | | | | | | | | | | | | | | | |
| Barnstaple | 0 8 | 31 | 28 | 7·38 | +2·18 | 1·09 | 30th | 1 | 30th | 25 | 6·27 | +3·16 | 0·65 | 30th | 0 | — | 25 | 5·71 | +1·94 | 0·60 | 27th | 0 | — | |
| Dublin | 3 0 | 57 | 22 | 3·42 | +0·27 | 0·55 | 16th | 0 | — | 24 | 3·41 | +0·66 | 0·60 | 22nd | 0 | — | 24 | 4·93 | +2·53 | 0·72 | 8th | 0 | — | |
| Florence Court (co. Fermanagh) | 13 0 | 300 | 25 | 5·11 | +1·01 | 0·81 | 23rd | 0 | — | 23 | 5·90 | +2·08 | 1·01 | 1st | 1 | 1st | 20 | 7·69 | +2·89 | 1·13 | 21st | 1 | 21st | |
| Galway | 8 2 | 30 | 23 | 6·45 | +1·45 | 0·67 | 29th | 0 | — | 24 | 5·77 | +1·60 | 0·79 | 22nd | 0 | — | 25 | 5·83 | +0·83 | 0·97 | 24th | 0 | — | |
| Guernsey | 12 0 | 204 | 28 | 11·36 | +6·95 | 2·14 | 4th | 3 | 4th 13th & 17th. | 27 | 7·19 | +3·35 | 0·76 | 27th | 0 | — | 26 | 7·02 | +3·15 | 1·08 | 20th | 1 | 20th | |
| Helston | 5 0 | 115 | 23 | 7·15 | +3·07 | 1·20 | 31st | 1 | 31st | 24 | 4·92 | +0·45 | 0·75 | 17th | 0 | — | 24 | 5·78 | +2·07 | 0·80 | 28th | 0 | — | |
| Jersey | 36 11 | 39 | 26 | 7·84 | +4·17 | 1·91 | 17th | 1 | 17th | 25 | 7·41 | +4·37 | 0·94 | 16th | 0 | — | 24 | 7·34 | +4·16 | 1·28 | 2nd | 2 | 2nd & 10th. | |
| Rugby | 3 0 | 383 | 21 | 3·02 | +0·41 | 0·67 | 20th | 0 | — | 26 | 4·74 | +3·26 | 0·86 | 22nd | 0 | — | 20 | 3·30 | +1·76 | 0·85 | 16th | 0 | — | |
| Sandwick (Orkney Islands) | 2 0 | 78 | 27 | 4·72 | +0·21 | 0·82 | 21st | 0 | — | 27 | 5·02 | +0·80 | 0·69 | 9th | 0 | — | 20 | 4·41 | +0·21 | 0·55 | 22nd | 0 | — | |

* Observer died. No observations taken during the greater part of the month. New observer appointed 25th November, and instrument shifted to new position.
† Instruments shifted to new position 1st November.
‡ Instruments shifted to new position in August.

## RAINFALL for the whole Year.

| Names of Stations. | No. of Rainy Days. | Total Fall. | Difference from the Average. |
|---|---|---|---|
| **OBSERVATORIES.** | | | |
| Valencia | 273 | 68·16. | +11·54 |
| Armagh | 226 | 39·96 | +10·28 |
| Glasgow | 240 | 53·27 | +10·44 |
| Aberdeen | 213 | 43·16 | +14·74 |
| Falmouth | 255 | 60·63 | +20·05 |
| Stonyhurst | 302 | 59·28 | +13·26 |
| Kew | 194 | 26·51 | + 3·61 |
| **TELEGRAPHIC REPORTING STATIONS.** | | | |
| Shetland, Sumburgh Head. | 220 | 49·55 | +23·41 |
| Thurso | 285 | 41·17 | +10·76 |
| Wick | 213 | 32·44 | + 8·32 |
| Nairn | 218 | 32·24 | + 8·31 |
| Leith | 195 | 35·68 | +15·84 |
| North Shields | 221 | 31·54 | + 6·28 |
| Scarborough | 210 | 39·91 | +14·19 |
| Yarmouth* | — | — | — |
| Ardrossan | 234 | 53·09 | +12·97 |
| Greencastle | 268 | 54·75 | +15·41 |
| Holyhead | 213 | 56·34 | +24·91 |
| Liverpool (Bidston Observatory). | 229 | 42·82 | +16·20 |
| **TELEGRAPHIC REPORTING STATIONS—*continued.*** | | | |
| Roche's Point | 223 | 60·95 | +14·05 |
| Pembroke | 269 | 53·86 | + 6·62 |
| Scilly | 252 | 45·43 | — |
| Plymouth | 219 | 44·81 | + 5·86 |
| Portsmouth | 200 | 34·27 | + 7·49 |
| Dover | 211 | 41·06 | — |
| London | 205 | 31·31 | + 6·81 |
| **EXTRA STATIONS.** (Information supplied by Societies, Private Individuals, and others.) | | | |
| Barnstaple | 249 | 56·76 | +18·85 |
| Dublin | 238 | 35·56 | + 6·54 |
| Florence Court (co. Fermanagh). | 255 | 60·81 | +18·89 |
| Galway | 252 | 56·37 | + 6·33 |
| Guernsey | 223 | 57·51 | +20·94 |
| Helston | 233 | 52·16 | +14·59 |
| Jersey | 214 | 45·67 | +14·61 |
| Rugby | 227 | 36·74 | +12·50 |
| Sandwick (Orkney Islands). | 253 | 39·27 | + 0·60 |

* Owing to the death of the observer in November, the records for that month (and consequently those for the year) are incomplete.

[3206.—500.]
[P. 2217.—125.] 12/73.]

# APPENDIX.

## APPENDIX I.

TABLE I.—MEAN MONTHLY RESULTS from the continuous RECORDS at the SEVEN BRITISH OBSERVATORIES, for the Year 1872.

### VALENCIA.

| MONTHS. | THERMOMETER. | | | | | BAROMETER. | | | | | PRESSURE. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. | | | | Means. | Extremes. | | | | Vap. | Dry Air. |
| | | Maximum. | | Minimum. | | | Maximum. | | Minimum. | | | |
| | | Day. | Ther. | Day. | Ther. | | Day. | Bar. | Day. | Bar. | | |
| | ° | D. H. | ° | D. H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
| January - | 45·7 | 11 23 | 53·6 | 19 21<br>20 18 | 34·7 | 29·397 | 13 23 | 30·058 | 24 2 | *28·321 | ·249 | 29·148 |
| February - | 47·3 | 28 1 | 53·3 | 3 9 | 38·8 | ·530 | 26 20<br>22 | 30·094 | 24 16 | 28·986 | ·265 | ·265 |
| March - | 47·5 | 16 2 | 55·7 | 25 16 | **31·4** | ·659 | 18 13 | 30·190 | 28 3 | 28·891 | ·267 | ·392 |
| April - | 48·6 | 14 3 | 59·9 | 3 18 | 34·1 | ·937 | 8 12 | 30·351 | 22 21 | 29·092 | ·271 | ·666 |
| May - | 50·7 | 14 3 | 64·8 | 9 16 | 40·0 | ·972 | 26 10 | **30·436** | 6 16 | 29·380 | ·281 | ·691 |
| June - | 55·2 | 20 5 | 66·2 | 5 16 | 45·0 | ·837 | 4 0 | 30·223 | 8 15 | 29·255 | ·363 | ·474 |
| July - | 59·7 | 24 6 | 69·7 | 6 14 | 48·6 | ·852 | 4 0 | 30·178 | 26 4 | 29·488 | ·436 | ·416 |
| August - | 59·6 | 19 0 | **75·5** | 12 17 | 47·8 | ·937 | 27 9 | 30·352 | 9 16 | 29·205 | ·408 | ·529 |
| September | 57·2 | 5 5 | 68·0 | 24 18 | 44·0 | ·826 | 13 7<br>8 | 30·319 | 4 10 | 29·130 | ·389 | ·437 |
| October - | 49·6 | 6 18 | 58·1 | 4 18 | 38·0 | ·669 | 4 20<br>21 | 30·346 | 24 15 | 28·570 | ·284 | ·385 |
| November - | 46·9 | 6 0 | 59·0 | 13 20 | 32·2 | ·563 | 10 10 | 30·409 | 22 19 | **28·301** | ·263 | ·300 |
| December - | 46·3 | 22 0 | 54·0 | 11 19 | 33·4 | 29·417 | 3 23 | 30·057 | 24 2 | 28·482 | ·261 | 29·156 |
| Annual - | 51·2 | .. | .. | .. | .. | 29·716 | .. | .. | .. | .. | ·311 | 29·405 |

* Doubtful, clock stopped during the next 2 hours.

Table I.—Mean Monthly Results, &c.—*continued.*

## ARMAGH.

| Months. | Thermometer. | | | | | Barometer. | | | | | Pressure. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. Maximum. | | Extremes. Minimum. | | Means. | Extremes. Maximum. | | Extremes. Minimum. | | Vap. | Dry Air. |
| | | Day. | Ther. | Day. | Ther. | | Day. | Bar. | Day. | Bar. | | |
| | ° | D. H. | ° | D. H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
| January | 40·5 | 29 4, 31 2 | 52·5 | 20 21 | **26·0** | 29·167 | 11 15, 26 22 | 29·780 | 17 13 | **28·053** | ·225 | 28·942 |
| February | 43·9 | 24 4 | 52·7 | 26 19 | 32·0 | ·396 | 26 22 | 30·013 | 1 10 | 28·868 | ·245 | 29·151 |
| March | 43·6 | 4 2 | 58·4 | 25 19 | 26·9 | ·487 | 9 21 | 30·003 | 28 7 | 28·819 | ·238 | ·249 |
| April | 46·3 | 10 1 | 60·9 | 2 18 | 31·7 | ·709 | 5 12 | 30·173 | 23 5 | 28·935 | ·253 | ·456 |
| May | 48·2 | 26 2 | 62·4 | 11 17 | 33·2 | ·694 | 10 11 | **30·183** | 3 18 | 28·894 | ·274 | ·420 |
| June | 55·1 | 16 3 | 71·5 | 5 14 | 41·0 | ·583 | 15 21 | 30·008 | 8 17 | 29·001 | ·358 | ·225 |
| July | 60·0 | 20 2 | **73·6** | 16 17 | 45·7 | ·700 | 4 1 | 29·968 | 10 7 | 29·438 | ·412 | ·288 |
| August | 58·0 | 22 3 | 71·5 | 31 17 | 46·5 | ·731 | 27 8 | 30·109 | 10 0, 1 | 29·151 | ·413 | ·318 |
| September | 53·6 | 13 2 | 72·5 | 25 18 | 39·0 | ·544 | 13 23 | 30·004 | 27 22 | 29·052 | ·360 | ·184 |
| October | 45·4 | 1 2 | 58·9 | 4 18 | 31·3 | ·419 | 4 22 | 30·143 | 24 5, 6 | 28·728 | ·265 | ·154 |
| November | 42·6 | 6 1 | 61·6 | 24 19 | 30·0 | ·320 | 12 9 | 30·162 | 23 8 | 28·225 | ·238 | ·082 |
| December | 40·2 | 22 1 | 52·4 | 11 21 | 27·9 | 29·244 | 3 23, 11 22 | 29·813 | 24 18, 19 | 28·410 | ·224 | 29·020 |
| Annual | 48·1 | .. | .. | .. | .. | 29·500 | .. | .. | .. | .. | ·292 | 29·207 |

## GLASGOW.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° | D. H. | ° | D H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
| January | 40·6 | 31 4 | 52·2 | 9 14 | 29·4 | 29·172 | 9 16 | 29·782 | 17 13 | *28·097 | ·218 | 28·954 |
| February | 42·0 | 13 2 | 50·0 | 7 19, 26 19 | 30·0 | ·464 | 26 21, 22 | 30·011 | 1 14 | 28·908 | ·229 | 29·235 |
| March | 42·1 | 7 2 | 58·6 | 25 18 | **25·5** | ·515 | 9 21 | 30·039 | 28 9, 10 | 28·889 | ·217 | ·298 |
| April | 45·7 | 12 0 | 59·1 | 18 16, 18 | 32·7 | ·695 | 5 12, 13, 20 | 30·210 | 23 4 | 29·092 | ·227 | ·468 |
| May | 47·5 | 26 4 | 61·0 | 20 17 | 32·9 | ·653 | 10 9, 10 | 30·143 | 4 1 | 28·687 | ·252 | ·401 |
| June | 54·8 | 18 2 | **75·1** | 3 12 | 41·9 | ·560 | 16 10 | 30·036 | 9 17 | 29·060 | ·341 | ·219 |
| July | 59·3 | 28 4 | **75·1** | 9 17 | 44·7 | ·722 | 4 0 | 29·967 | 8 4 | 29·456 | ·393 | ·329 |
| August | 56·4 | 19 4 | 73·1 | 13 16 | 43·0 | ·739 | 13 20, 22 | 30·086 | 10 5 | 29·215 | ·378 | ·361 |
| September | 51·6 | 4 3 | 65·2 | 21 15 | 36·0 | ·493 | 13 20 | 29·962 | 28 3 | 28·827 | ·328 | ·165 |
| October | 45·9 | 1 1 | 57·6 | 4 20 | 28·3 | ·409 | 4 21, 22 | 30·137 | 23 19 | 28·825 | ·255 | ·154 |
| November | 42·0 | 6 2 | 59·8 | 18 22 | 29·8 | ·319 | 12 23 | **30·211** | 23 11 | 28·267 | ·223 | ·096 |
| December | 39·1 | 26 18 | 51·1 | 11 19 | 25·6 | 29·263 | 3 23 | 29·779 | 24 20 | 28·467 | ·211 | 29·052 |
| Annual | 47·3 | .. | .. | .. | .. | 29·500 | .. | .. | .. | .. | ·273 | 29·228 |

* Doubtful, the trace not being visible from 13 hours to 21 hours.

Table I.—Mean Monthly Results, &c.—*continued.*

## ABERDEEN.

| Months. | Thermometer. | | | | | | Barometer. | | | | | | Pressure. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. | | | | Means. | Extremes. | | | | Vap. | Dry Air. |
| | | Maximum. | | Minimum. | | | Maximum. | | Minimum. | | | |
| | | Day. | Ther. | Day. | Ther. | | Day. | Bar. | Day. | Bar. | | |
| | ° | D. H. | ° | D. H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
| January - | 40·0 | 30 2 | 49·9 | 9 17<br>27 21 | 30·3 | 29·268 | 27 22 | 29·917 | 17 20 | **28·077** | ·217 | 29·051 |
| February - | 41·2 | 29 2 | 53·5 | 7 21 | 31·2 | ·613 | 26 23 | 30·073 | 1 17 | 29·085 | ·227 | ·386 |
| March - | 41·0 | 16 2 | 55·2 | 20 20 | 29·0 | ·629 | 9 20 | 30·153 | 28 11 | 29·042 | ·213 | ·416 |
| April - | 44·9 | 14 2 | 59·1 | 20 10 | 34·0 | ·774 | 5 11 | 30·320 | 22 16 | 29·299 | ·236 | ·538 |
| May - | 47·4 | 26 4 | 65·0 | 17 16<br>18 16 | 34·8 | ·735 | 10 9 | 30·242 | 4 3 | 28·797 | ·255 | ·480 |
| June - | 53·9 | 17 21 | 65·1 | 3 13 | 43·2 | ·677 | 16 2 | 30·145 | 8 16 | 29·186 | ·348 | ·329 |
| July - | 57·5 | 4 1<br>22 | **74·5** | 16 16 | 44·7 | ·847 | 25 8 | 30·084 | 8 13<br>14 | 29·486 | ·391 | ·456 |
| August - | 55·0 | 19 2 | 65·8 | 5 17 | 40·3 | ·866 | 18 11 | 30·228 | 10 18 | 29·335 | ·367 | ·499 |
| September | 51·0 | 12 3 | 66·7 | 22 13 | 36·1 | ·555 | 13 22 | 30·030 | 28 3 | 28·782 | ·313 | ·242 |
| October - | 46·6 | 2 2 | 57·8 | 4 18 | 33·3 | ·476 | 4 22 | 30·233 | 30 11<br>17<br>18 | 28·922 | ·264 | ·212 |
| November - | 43·1 | 6 3 | 61·0 | 27 20 | 31·2 | ·424 | 12 21 | **30·371** | 23 13 | 28·417 | ·231 | ·193 |
| December - | 39·3 | 27 5 | 49·2 | 4 19 | **26·7** | 29·394 | 21 15 | 29·886 | 24 22 | 28·627 | ·211 | 29·183 |
| Annual - | 46·7 | .. | .. | .. | .. | 29·605 | .. | .. | .. | .. | ·273 | 29·332 |

## FALMOUTH.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° | D. H. | ° | D. H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
| January - | 46·0 | 4 10 | 53·2 | 19 16 | 37·0 | 29·360 | 11 17 | 29·928 | 23 12 | **28·195** | ·263 | 29·097 |
| February - | 47·6 | 29 1 | 55·5 | 20 20 | 40·4 | ·515 | 27 0 | 29·983 | 1 8 | 29·046 | ·283 | ·232 |
| March - | 47·0 | 16 2 | 57·1 | 22 18 | **32·7** | ·555 | 10 0 | 30·111 | 30 3 | 28·907 | ·264 | ·291 |
| April - | 48·2 | 15 3 | 58·8 | 19 16 | 36·8 | ·728 | 5 22<br>6 9 | **30·273** | 21 19 | 28·644 | ·261 | ·467 |
| May - | 50·4 | 28 2 | 63·1 | 11 16 | 36·6 | ·743 | 26 19<br>20 | 30·223 | 6 19 | 29·248 | ·289 | ·454 |
| June - | 56·5 | 17 1 | 70·2 | 6 17 | 46·0 | ·721 | 16 0 | 30·097 | 8 19 | 29·131 | ·376 | ·345 |
| July - | 61·5 | 21 2 | **71·4** | 7 17 | 54·2 | ·723 | 4 0 | 30·100 | 29 15 | 29·437 | ·457 | ·266 |
| August - | 60·7 | 21 0 | 71·0 | 12 16 | 51·0 | ·777 | 27 10 | 30·145 | 5 2 | 29·241 | ·426 | ·351 |
| September | 57·8 | 14 23 | 68·9 | 22 19 | 43·7 | ·686 | 12 22 | 30·188 | 23 20 | 29·182 | ·398 | ·288 |
| October - | 50·1 | 2 1 | 61·6 | 13 19 | 40·5 | ·488 | 6 9<br>6 10 | 30·130 | 25 2 | 28·818 | ·306 | ·182 |
| November | 47·9 | 5 23 | 57·3 | 12 20 | 36·5 | ·470 | 7 9 | 30·207 | 30 4<br>5 | 28·351 | ·280 | ·190 |
| December - | 46·7 | 22 1 | 54·9 | 11 20 | 34·7 | 29·337 | 4 12 | 29·833 | 24 15<br>17 | 28·690 | ·274 | 29·063 |
| Annual - | 51·7 | | | | | 29·592 | | | | | ·323 | 29·269 |

## Table I.—Mean Monthly Results, &c.—*continued.*

### STONYHURST.

| Months. | Thermometer. | | | | | Barometer. | | | | | Pressure. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. Maximum. | | Minimum. | | Means. | Extremes. Maximum. | | Minimum. | | Vap. | Dry Air. |
| | | Day. | Ther. | Day. | Ther. | | Day. | Bar. | Day. | Bar. | | |
| | ° | D. H. | ° | D. H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
| January - | 40·6 | 30 2 | 53·9 | 9 16 | 29·2 | 29·092 | 11 23 | 29·690 | 23 20 | **28·046** | ·221 | 28·871 |
| February - | 43·3 | 10 2 | 52·8 | 16 10 | 36·3 | ·336 | 26 23 | 29·828 | 1 14 | 28·892 | ·237 | 29·099 |
| March - | 43·4 | 6 3 | 58·6 | 25 17 | **22·1** | ·357 | 9 22 | 29·906 | 27 15 | 28·639 | ·226 | ·131 |
| April - | 45·7 | 12 0 | 62·8 | 19 15 | 32·3 | ·525 | 5 19 / 20 | **30·086** | 21 16 | 28·763 | ·239 | ·286 |
| May - | 48·3 | 1 3 | 64·1 | 18 15 | 34·8 | ·496 | 26 10 | 29·981 | 4 1 | 28·829 | ·261 | ·235 |
| June - | 55·9 | 18 0 | 79·2 | 6 15 | 37·2 | ·444 | 15 23 | 29·899 | 9 7 | 28·782 | ·358 | ·086 |
| July - | 61·5 | 21 4 | **81·7** | 30 16 | 43·7 | ·541 | 3 23 | 29·853 | 7 22 | *29·313 | ·422 | ·119 |
| August - | 58·4 | 18 3 | 77·8 | 31 18 | 47·7 | ·568 | 27 11 | 29·925 | 10 6 | 29·000 | ·391 | ·177 |
| September | 54·5 | 4 3 | 71·4 | 21 18 | 36·1 | ·366 | 12 22 | 29·868 | 28 2 | 28·933 | ·347 | 29·019 |
| October - | 46·3 | 2 2 | 58·8 | 14 19 | 30·6 | ·255 | 5 20 | 29·933 | 10 9 | 28·627 | ·266 | 28·989 |
| November | 43·3 | 6 3 | 60·9 | 18 20 | 27·1 | ·191 | 12 9 | 29·889 | 30 13 | 28·315 | ·235 | ·956 |
| December | 40·4 | 22 7 | 50·4 | 4 20 / 11 16 | 25·6 | 29·120 | 4 9 / 10 | 29·589 | 8 12 | 28·083 | ·220 | 28·900 |
| Annual - | 48·5 | | | | | 29·358 | | | | | ·285 | 29·072 |

* This is the lowest reading recorded, but the trace being indistinct on the 6th and 7th, it is doubtful whether this is the min. or not.

### KEW.

| | ° | D. H. | ° | D. H. | ° | In. | D. H. | In. | D. H. | In. | In. | In. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January - | 41·9 | 4 16 | 52·6 | 14 21 | **26·0** | 29·600 | 11 23 | 30·165 | 23 17 | **28·310** | ·234 | 29·366 |
| February - | 45·1 | 10 2 | 56·0 | 21 14 | 32·3 | ·793 | 27 10 | 30·205 | 25 18 | 29·461 | ·254 | ·539 |
| March - | 44·8 | 7 1 | 59·7 | 25 17 | 27·4 | ·773 | 9 21 / 22 | 30·316 | 30 3 | 29·235 | ·241 | ·532 |
| April - | 48·5 | 27 2 | 66·8 | 19 18 | 29·6 | ·903 | 5 22 | **30·475** | 21 5 | 29·026 | ·255 | ·648 |
| May - | 51·0 | 27 6 | 70·4 | 19 16 | 32·5 | ·884 | 26 20 | 30·355 | 6 23 | 29·363 | ·283 | ·601 |
| June - | 59·7 | 18 3 | *83·4 | 6 16 | 42·6 | ·878 | 15 20 | 30·270 | 9 5 | 29·371 | ·378 | ·500 |
| July - | 65·1 | 25 3 | **88·6** | 30 17 | 47·5 | ·903 | 3 19 | 30·220 | 29 18 | 29·623 | ·443 | ·460 |
| August - | 60·9 | 17 3 | 81·1 | 27 17 | 45·8 | ·947 | 27 19 | 30·307 | 5 7 | 29·442 | ·400 | ·547 |
| September | 57·6 | 3 3 | 81·1 | 22 ? | †33·5 | ·827 | 12 22 | 30·297 | 24 1 | 29·341 | ·374 | ·453 |
| October - | 48·0 | 2 3 | 63·5 | 13 18 | 30·2 | ·680 | 6 10 | 30·351 | 24 11 | 29·157 | ·292 | ·388 |
| November | 45·8 | 4 23 | 60·1 | 17 15 | 32·5 | ·644 | 7 10 | 30·373 | 30 11 | 28·816 | ·263 | ·381 |
| December | 43·2 | 22 2 | 53·1 | 11 20 | 29·4 | 29·566 | 4 21 | 29·999 | 10 6 | 28·766 | ·247 | 29·319 |
| Annual - | 51·0 | | | | | 29·783 | | | | | ·305 | 29·478 |

* Doubtful, trace being scarcely discernible through zero line from 0 to 6 hours on 17th, when readings were very high.

† Reading of a minimum thermometer, the curve being indistinct.

## TABLE II.—PART 1.

**FIVE-DAY MEANS of the DRY and WET BULB THERMOMETERS and BAROMETER, from the continuous Records at the Seven BRITISH OBSERVATORIES, January to June 1872.**

| Five-Day Periods. | THERMOMETERS. | | | | | | | | | | | | | | BAROMETER. | | | | | | | Five-Day Periods. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Valencia. 12 ft. | | Armagh. 4 ft. | | Glasgow. 7 ft. | | Aberdeen. 41 ft. | | Falmouth. 11 ft. | | Stonyhurst. 7 ft. | | Kew. 10 ft. | | Valencia. 23 ft. | Armagh. 207 ft. | Glasgow. 184 ft. | Aberdeen. 88 ft. | Falmouth. 211 ft. | Stonyhurst. 361 ft. | Kew. 34 ft. | |
| | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | | | | | | | | |
| | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | In. | In. | In. | In. | In. | In. | In. | |
| Jan. 1–5 | 44·5 | 41·2 | 38·4 | 36·8 | 39·3 | 37·2 | 39·1 | 36·8 | 46·0 | 43·5 | 40·0 | 38·4 | 43·5 | 41·3 | 29·287 | 29·014 | 28·983 | 29·056 | 29·325 | 28·972 | 29·568 | Jan. 1–5 |
| ,, 6–10 | 45·3 | 42·4 | 37·9 | 36·9 | 35·8 | 34·5 | 36·5 | 35·2 | 44·2 | 41·8 | 36·5 | 35·2 | 38·5 | 37·1 | ·564 | ·282 | 29·273 | ·355 | ·460 | 29·156 | ·623 | ,, 6–10 |
| ,, 11–15 | 47·4 | 44·7 | 42·4 | 40·9 | 42·3 | 40·7 | 41·0 | 39·4 | 46·2 | 44·3 | 41·5 | 40·3 | 40·8 | 39·6 | ·789 | 29·529 | 29·501 | 29·575 | ·755 | 29·449 | ·960 | ,, 11–15 |
| ,, 16–20 | 43·7 | 41·6 | 39·9 | 38·5 | 41·1 | 39·5 | 40·3 | 38·5 | 44·2 | 41·9 | 39·3 | 37·8 | 40·7 | 39·3 | 29·285 | 28·989 | 28·938 | 28·992 | 29·236 | 28·927 | ·464 | ,, 16–20 |
| ,, 21–25 | 44·7 | 42·4 | 38·7 | 38·0 | (38·6) | 37·4 | 40·1 | 39·1 | 46·5 | 44·5 | 40·2 | 38·8 | 43·6 | 42·2 | 28·896 | 28·780 | 28·876 | 29·045 | 28·771 | 28·662 | ·103 | ,, 21–25 |
| ,, 26–30 | 47·9 | 45·6 | 44·3 | 42·6 | *48·6 | 42·5 | 41·8 | 40·6 | 47·7 | 46·2 | 44·4 | 42·8 | 43·7 | 42·4 | 29·624 | 29·453 | 29·488 | ·603 | 29·614 | 29·380 | ·850 | ,, 26–30 |
| Feb. 31–4 | 46·5 | 43·5 | 44·4 | 42·1 | 44·8 | 42·0 | 44·0 | 42·3 | 47·9 | 46·0 | 44·5 | 42·3 | 45·0 | 43·0 | ·285 | ·175 | ·270 | ·427 | ·394 | ·231 | ·752 | Feb. 31–4 |
| ,, 5–9 | 48·3 | 45·8 | 44·7 | 42·7 | 41·6 | 40·0 | 41·6 | 40·3 | 48·6 | 47·0 | 44·4 | 42·4 | 47·0 | 45·2 | ·533 | ·464 | ·552 | ·694 | ·571 | ·423 | ·867 | ,, 5–9 |
| ,, 10–14 | 47·5 | 44·9 | 45·8 | 44·0 | 44·1 | 42·0 | 42·2 | 41·0 | 48·4 | 46·7 | 44·8 | 42·8 | 46·1 | 44·1 | ·367 | (·388) | ·524 | ·747 | ·328 | ·335 | ·728 | ,, 10–14 |
| ,, 15–19 | 45·4 | 42·0 | 41·0 | 39·2 | 39·9 | 38·2 | 39·2 | 37·6 | 45·8 | 43·9 | 40·6 | 38·6 | 43·5 | 41·5 | ·654 | ·350 | ·344 | ·466 | ·551 | ·256 | ·741 | ,, 15–19 |
| ,, 20–24 | 47·4 | 45·2 | 44·2 | 42·5 | 41·6 | 40·5 | 40·5 | 39·1 | 47·7 | 45·8 | 43·7 | 42·0 | 44·8 | 42·9 | ·550 | ·384 | ·452 | ·604 | ·582 | ·335 | ·830 | ,, 20–24 |
| ,, 25–1 | 49·3 | 47·5 | 44·8 | 43·0 | 41·8 | 39·8 | 41·1 | 39·0 | 48·2 | 46·2 | 43·6 | 41·5 | 45·2 | 43·0 | ·702 | ·534 | ·571 | ·681 | ·650 | ·406 | 29·847 | ,, 25–1 |
| Mar. 2–6 | 51·4 | 49·2 | 50·4 | 47·6 | (49·9) | (46·2) | 47·0 | 45·0 | 51·1 | 49·2 | 49·0 | 45·8 | 49·1 | 46·3 | ·640 | ·578 | ·659 | ·766 | ·682 | ·574 | 30·028 | Mar. 2–6 |
| ,, 7–11 | 47·3 | 44·9 | 44·8 | 42·9 | 44·5 | 41·9 | 42·2 | 40·5 | 46·6 | 43·9 | 45·6 | 42·1 | 44·3 | 41·6 | ·786 | ·570 | ·587 | ·703 | ·707 | ·491 | 29·916 | ,, 7–11 |
| ,, 12–16 | 49·4 | 47·2 | 46·6 | 44·7 | 46·0 | 43·9 | 44·8 | 42·9 | 48·6 | 46·5 | 45·6 | 43·3 | 47·3 | 44·6 | 29·626 | ·409 | ·446 | ·564 | ·585 | ·358 | ·807 | ,, 12–16 |
| ,, 17–21 | 46·5 | 43·3 | 40·4 | 37·5 | 39·4 | 36·5 | 38·0 | 35·5 | 44·1 | 40·9 | 39·0 | 36·0 | 40·5 | 37·7 | 30·034 | ·768 | ·696 | ·756 | ·750 | ·478 | ·831 | ,, 17–21 |
| ,, 22–26 | 40·1 | 36·2 | 35·5 | 33·7 | 34·6 | 32·2 | 34·9 | 33·0 | 39·0 | 35·7 | 33·9 | 31·8 | 34·8 | 33·2 | 29·716 | ·558 | ·575 | ·680 | ·451 | 29·316 | ·640 | ,, 22–26 |
| ,, 27–31 | 49·7 | 47·4 | 42·8 | 41·8 | 39·0 | 37·2 | 39·1 | 36·5 | 51·5 | 49·8 | 46·7 | 45·1 | 51·5 | 49·4 | 29·138 | ·016 | ·100 | ·268 | ·119 | 28·896 | ·388 | ,, 27–31 |
| Apr. 1–5 | 46·7 | 43·1 | 42·2 | 39·6 | 41·0 | 37·3 | 39·8 | 43·8 | 45·4 | 42·1 | 41·2 | 38·4 | 44·2 | 41·7 | 30·002 | ·773 | ·768 | ·847 | 29·736 | 29·526 | 29·843 | Apr. 1–5 |
| ,, 6–10 | 51·3 | 50·1 | 50·4 | 47·6 | 48·6 | 45·2 | 47·1 | 43·9 | 49·9 | 47·7 | 47·5 | 44·8 | 48·8 | 45·4 | ·205 | ·931 | ·875 | ·907 | 30·100 | ·797 | 30·237 | ,, 6–10 |
| ,, 11–15 | 49·3 | 46·0 | 47·8 | 45·0 | 48·3 | 44·6 | 49·5 | 44·6 | 50·8 | 47·1 | 48·3 | 45·0 | 52·7 | 47·3 | 30·124 | ·865 | ·779 | ·788 | 29·892 | ·665 | 30·062 | ,, 11–15 |
| ,, 16–20 | 46·6 | 41·9 | 41·8 | 38·5 | 41·4 | 36·2 | 40·1 | 37·2 | 45·3 | 40·8 | 41·0 | 37·1 | 43·1 | 39·2 | 29·943 | ·717 | ·684 | ·749 | ·608 | ·439 | 29·739 | ,, 16–20 |
| ,, 21–25 | 46·8 | 44·0 | 44·8 | 42·5 | 44·4 | 41·7 | 43·8 | 42·2 | 46·6 | 44·3 | 45·9 | 43·3 | 49·2 | 45·9 | 29·295 | ·131 | ·231 | ·431 | ·098 | ·008 | 29·438 | ,, 21–25 |
| ,, 26–30 | 51·1 | 48·3 | 50·8 | 48·2 | 50·3 | 48·9 | 49·2 | 46·6 | 50·9 | 48·0 | 50·2 | 47·0 | 53·0 | 49·1 | 30·055 | ·835 | ·833 | ·920 | ·931 | ·716 | 30·097 | ,, 26–30 |
| May 1–5 | 50·9 | 48·2 | 49·9 | 47·1 | 48·5 | 45·3 | 49·1 | 45·9 | 51·3 | 48·2 | 49·6 | 47·0 | 53·4 | 48·8 | 29·852 | ·499 | ·421 | ·484 | ·739 | ·374 | 29·858 | May 1–5 |
| ,, 6–10 | 48·8 | 44·6 | 45·7 | 43·1 | 45·3 | 41·7 | 44·2 | 41·0 | 49·1 | 45·4 | 45·2 | 42·1 | 47·5 | 44·5 | ·879 | ·536 | ·495 | ·600 | ·620 | ·306 | ·714 | ,, 6–10 |
| ,, 11–15 | 51·9 | 47·6 | 47·1 | 45·1 | 47·0 | 44·4 | 46·7 | 45·0 | 47·6 | 45·0 | 47·5 | 44·1 | 47·7 | 45·1 | ·972 | ·803 | ·834 | ·979 | ·673 | ·548 | ·832 | ,, 11–10 |
| ,, 16–20 | 47·8 | 44·1 | 44·5 | 41·9 | 43·7 | 40·2 | 43·1 | 39·7 | 49·3 | 46·0 | 44·9 | 40·9 | 47·1 | 44·3 | 29·794 | ·575 | ·541 | ·608 | ·488 | ·353 | ·705 | ,, 16–20 |
| ,, 21–25 | 50·3 | 46·9 | 48·4 | 46·0 | 48·4 | 45·1 | 47·9 | 45·2 | 49·6 | 46·6 | 48·8 | 45·4 | 51·2 | 46·7 | 30·090 | ·814 | ·746 | ·826 | 29·856 | ·606 | 29·998 | ,, 21–25 |
| ,, 26–30 | 54·0 | 51·1 | 53·7 | 50·5 | 51·8 | 48·4 | 53·4 | 48·8 | 54·9 | 52·4 | 53·5 | 50·3 | 59·2 | 54·4 | ·211 | ·906 | ·854 | ·893 | 30·041 | ·760 | 30·168 | ,, 26–30 |
| June 31–4 | 52·6 | 49·2 | 50·4 | 48·0 | 50·3 | 46·8 | 50·2 | 47·4 | 53·3 | 49·6 | 50·9 | 47·4 | 53·2 | 49·3 | 30·064 | ·716 | ·661 | ·757 | 29·859 | ·537 | 29·954 | June 31–4 |
| ,, 5–9 | 50·6 | 47·2 | 49·3 | 46·7 | 50·2 | 47·2 | 50·2 | 49·0 | 52·5 | 49·7 | 49·4 | 46·9 | 54·0 | 51·0 | 29·640 | ·339 | ·346 | ·488 | ·489 | ·188 | ·682 | ,, 5–9 |
| ,, 10–14 | 55·7 | 54·0 | 55·7 | 53·0 | 54·6 | 51·8 | 54·2 | 51·3 | 55·9 | 53·4 | 55·1 | 52·7 | 58·6 | 54·6 | (·782) | ·566 | ·544 | ·627 | ·708 | ·422 | 29·841 | ,, 10–14 |
| ,, 15–19 | 58·5 | 56·8 | 61·8 | 59·0 | 60·9 | 58·4 | 58·0 | 56·1 | 61·2 | 58·5 | 64·6 | 60·9 | 68·9 | 63·1 | ·976 | ·792 | ·736 | ·944 | ·863 | ·670 | (30·084) | ,, 15–19 |
| ,, 20–24 | 57·0 | 54·5 | 56·9 | 53·7 | 56·6 | 52·8 | 55·4 | 52·7 | 58·0 | 55·4 | 58·5 | 54·4 | 62·7 | 57·0 | ·826 | ·609 | ·609 | ·722 | ·739 | ·501 | 29·924 | ,, 20–24 |
| ,, 25–29 | 55·7 | 52·7 | 55·0 | 51·8 | 54·0 | 50·6 | 54·2 | 50·9 | 57·2 | 54·2 | 54·8 | 51·6 | 58·8 | 54·2 | 29·824 | 29·556 | 29·511 | 29·558 | 29·731 | 29·403 | 29·861 | ,, 25–29 |

NOTE.—The heights in the headings of the temperature columns are those of the thermometer bulbs above the ground. Those in the headings of the pressure columns are those of the barometer cisterns above mean sea level.

Owing to Leap year the period February 25 to March 1 contains *six days*. Means which are in brackets are for four days only, owing to various causes, such as clock stopping, defective photography, &c.

* Mean for two days only, viz., January 29 and 30.

## TABLE II.—PART 2.

FIVE-DAY MEANS of the DRY and WET THERMOMETERS and BAROMETER, from the continuous Records at the Seven BRITISH OBSERVATORIES, July to December 1872.

| Five-Day Periods. | Thermometers. Valencia. 12 ft. Dry. | Valencia. 12 ft. Wet. | Armagh. 4 ft. Dry. | Armagh. 4 ft. Wet. | Glasgow. 7 ft. Dry. | Glasgow. 7 ft. Wet. | Aberdeen. 41 ft. Dry. | Aberdeen. 41 ft. Wet. | Falmouth. 11 ft. Dry. | Falmouth. 11 ft. Wet. | Stonyhurst. 7 ft. Dry. | Stonyhurst. 7 ft. Wet. | Kew. 10 ft. Dry. | Kew. 10 ft. Wet. | Barometer. Valencia. 23 ft. | Armagh. 207 ft. | Glasgow. 184 ft. | Aberdeen. 88 ft. | Falmouth. 211 ft. | Stonyhurst. 361 ft. | Kew. 34 ft. | Five-Day Periods. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | ° | In. | In. | In. | In. | In. | In. | In. | |
| June 30–4 | 58·1 | 56·1 | 60·1 | 56·8 | 59·9 | 55·7 | 58·9 | 55·5 | 59·4 | 56·7 | 60·3 | 55·8 | 63·5 | 57·4 | 29·969 | 29·750 | (29·824) | 29·840 | 29·900 | 29·633 | 30·040 | June 30–4 |
| July 5–9 | 56·8 | 54·3 | 57·4 | 53·9 | 56·2 | 53·1 | 57·8 | 55·2 | 59·3 | 57·0 | 59·6 | 56·5 | 65·4 | (59·5) | ·881 | ·674 | ·659 | ·756 | ·691 | *·489 | 29·837 | July 5–9 |
| ,, 10–14 | 59·0 | 56·7 | (59·3) | (56·4) | 60·6 | 56·9 | 56·0 | 54·3 | 60·3 | 57·8 | 60·0 | 57·1 | 62·6 | 58·2 | ·842 | ·690 | ·733 | ·917 | ·666 | ·490 | ·852 | ,, 10–14 |
| ,, 15–19 | 60·1 | 57·2 | 58·0 | 54·6 | 57·9 | 52·3 | 55·1 | 50·5 | 62·0 | 58·8 | 59·4 | 55·2 | 61·3 | 57·0 | ·919 | ·742 | ·735 | ·847 | ·791 | ·573 | ·953 | ,, 15–19 |
| ,, 20–24 | 61·4 | 59·3 | 62·9 | 59·5 | 62·8 | 59·7 | 60·7 | 58·2 | 63·8 | 61·0 | 66·4 | 62·1 | 70·5 | 65·4 | ·779 | ·642 | ·684 | ·809 | ·701 | ·525 | ·897 | ,, 20–24 |
| ,, 25–29 | 61·8 | 59·7 | 62·5 | 59·8 | 60·3 | 58·0 | 57·5 | 56·4 | 63·1 | 61·0 | 66·3 | 62·1 | 69·5 | 63·7 | ·646 | ·639 | ·721 | ·893 | ·586 | ·488 | ·842 | ,, 25–29 |
| Aug. 30–3 | 58·6 | 55·5 | 55·1 | 52·0 | 54·8 | 50·5 | 52·8 | 49·3 | 60·0 | 56·5 | 54·7 | 50·8 | 58·6 | 54·4 | ·877 | ·665 | ·654 | ·759 | ·631 | ·446 | ·785 | Aug. 30–3 |
| ,, 4–8 | 58·9 | 55·9 | (56·5) | (54·2) | 54·9 | 52·1 | 52·6 | 49·5 | 59·5 | 57·0 | 57·2 | 54·1 | 59·9 | 56·9 | ·658 | ·493 | ·519 | ·670 | ·508 | ·320 | ·681 | ,, 4–8 |
| ,, 9–13 | 57·8 | 54·7 | 56·2 | 51·0 | 56·3 | 53·6 | 55·6 | 53·6 | 58·6 | 54·9 | 57·1 | 54·8 | 59·8 | 55·3 | ·978 | ·684 | ·632 | 29·744 | ·821 | ·485 | 29·954 | ,, 9–13 |
| ,, 14–18 | 62·1 | (58·4) | 61·0 | 58·6 | 58·4 | 56·1 | 57·5 | 56·1 | 63·0 | (59·8) | 61·5 | 57·3 | 62·9 | (57·3) | 29·963 | ·851 | ·919 | 30·070 | ·890 | ·780 | 30·151 | ,, 14–18 |
| ,, 19–23 | 60·9 | 57·5 | 61·9 | 58·7 | 59·1 | 55·9 | 55·3 | 53·3 | 63·3 | 60·5 | 61·3 | 56·9 | 64·7 | 59·6 | 30·061 | ·914 | ·980 | 30·134 | ·841 | ·753 | ·044 | ,, 19–23 |
| ,, 24–28 | 59·9 | 57·3 | 58·6 | 56·3 | 56·1 | 53·7 | 55·5 | 53·6 | 60·8 | 57·5 | 58·8 | 55·6 | 60·8 | 56·1 | 30·146 | ·878 | ·855 | 29·953 | ·972 | ·706 | 30·093 | ,, 24–28 |
| Sept. 29–2 | 59·4 | 56·7 | 54·3 | 53·1 | 52·7 | 50·4 | 52·4 | 50·0 | 60·5 | 57·9 | 56·3 | 53·8 | 60·3 | 56·6 | 29·716 | ·542 | ·563 | ·682 | ·629 | ·397 | 29·828 | Sept. 29–2 |
| ,, 3–7 | 60·4 | 57·7 | 58·6 | 56·8 | 57·5 | 56·2 | 57·1 | 55·6 | 61·2 | 58·8 | 61·4 | 58·1 | 65·2 | 60·2 | ·568 | ·422 | ·464 | ·602 | ·485 | ·303 | 29·749 | ,, 3–7 |
| ,, 8–12 | 61·0 | 59·7 | 60·1 | 58·3 | 56·6 | 54·9 | 56·4 | 53·8 | 61·5 | 59·2 | 59·2 | 57·3 | 62·9 | 58·5 | 29·915 | ·619 | ·567 | ·628 | ·863 | ·510 | 30·005 | ,, 8–12 |
| ,, 13–17 | 58·8 | 57·2 | 56·3 | 54·5 | 53·5 | (51·7) | 54·8 | 50·7 | 61·5 | 59·1 | 57·1 | 54·3 | 61·9 | 58·0 | 30·062 | ·738 | ·642 | ·675 | ·877 | ·553 | 29·979 | ,, 13–17 |
| ,, 18–22 | 52·2 | 47·9 | 46·7 | 44·7 | 45·6 | 42·3 | 44·0 | 41·5 | 51·4 | 47·2 | 47·1 | 43·2 | (48·0) | (44·4) | 29·938 | ·559 | ·479 | ·518 | ·668 | ·322 | ·744 | ,, 18–22 |
| ,, 23–27 | 53·0 | 49·4 | 47·3 | 45·2 | (46·5) | (43·5) | 45·7 | 43·8 | 53·0 | 50·5 | 48·2 | 45·6 | 51·0 | 47·7 | ·813 | ·448 | (·348) | ·375 | ·621 | ·190 | ·691 | ,, 23–27 |
| Oct. 28–2 | 54·7 | 51·6 | 51·9 | 50·0 | 50·3 | 48·3 | 49·9 | 47·3 | 55·8 | 53·2 | 52·2 | 50·1 | 54·9 | 51·9 | 29·562 | ·247 | ·288 | ·242 | ·496 | ·140 | 29·663 | Oct. 28–2 |
| ,, 3–7 | 49·7 | 46·8 | 44·8 | 42·5 | 43·2 | 40·5 | 44·4 | 41·1 | 49·6 | 47·0 | 45·5 | 43·1 | 47·4 | 45·2 | 30·083 | ·841 | ·793 | ·837 | ·891 | ·676 | 30·071 | ,, 3–7 |
| ,, 8–12 | 49·7 | 46·2 | 43·5 | 42·3 | 44·9 | 41·8 | 45·4 | 43·0 | 49·2 | 46·3 | 45·3 | 42·7 | 46·0 | 44·1 | 29·800 | ·440 | ·347 | ·374 | ·567 | ·172 | 29·651 | ,, 8–12 |
| ,, 13–17 | 48·2 | 45·4 | 43·3 | 42·0 | 43·3 | 41·2 | 43·8 | 42·3 | 46·8 | 44·4 | 43·2 | 41·2 | 43·6 | 42·2 | ·787 | ·571 | ·583 | ·714 | ·460 | ·350 | ·678 | ,, 13–17 |
| ,, 18–22 | 48·5 | 45·3 | 45·2 | 43·7 | 47·1 | 44·7 | 47·7 | 46·2 | 49·6 | 47·4 | 46·4 | 45·1 | 48·3 | 47·4 | ·660 | ·410 | ·388 | ·499 | ·368 | 29·214 | ·578 | ,, 18–22 |
| ,, 23–27 | 48·3 | 46·5 | 46·1 | 44·7 | 47·9 | 45·8 | 48·6 | 47·3 | 50·6 | 48·5 | 46·7 | 44·8 | 48·3 | 46·6 | ·185 | ·071 | ·143 | ·322 | ·141 | 28·992 | ·429 | ,, 23–27 |
| Nov. 28–1 | 50·5 | 48·2 | 46·5 | 44·6 | 46·5 | 44·3 | 46·6 | 43·0 | 52·3 | 50·7 | 47·6 | 45·5 | 50·9 | 49·2 | ·558 | ·209 | ·126 | ·150 | ·549 | 29·151 | ·703 | Nov. 28–1 |
| ,, 2–6 | 52·2 | 49·7 | 49·2 | 47·4 | 47·4 | 45·3 | 47·1 | 44·5 | 52·3 | 50·5 | 48·6 | 46·6 | 51·2 | 48·9 | 29·722 | ·374 | ·310 | ·345 | ·704 | ·287 | 29·821 | ,, 2–6 |
| ,, 7–11 | 47·5 | 45·4 | 41·8 | 39·9 | 41·7 | 38·9 | 40·9 | 38·2 | 47·2 | 45·1 | 42·8 | 40·1 | 44·5 | 42·2 | 30·256 | ·912 | ·800 | 29·821 | ·954 | ·645 | 30·024 | ,, 7–11 |
| ,, 12–16 | 40·1 | 36·9 | 36·8 | 35·0 | 38·1 | 35·3 | 40·3 | 37·5 | 41·7 | 38·7 | 37·9 | 35·7 | 38·5 | 36·6 | 30·126 | ·911 | ·926 | 30·084 | ·720 | ·583 | 29·782 | ,, 12–16 |
| ,, 17–21 | 47·2 | 44·1 | 40·7 | 39·3 | 39·8 | 38·3 | 42·8 | 40·8 | 47·3 | 45·2 | 39·9 | 38·5 | 43·1 | 41·9 | 29·297 | 29·092 | 29·141 | 29·289 | ·283 | 29·033 | ·509 | ,, 17–21 |
| ,, 22–26 | 48·6 | 46·1 | 44·4 | 42·9 | 44·9 | 43·0 | 45·8 | 44·0 | 50·3 | 48·1 | 46·2 | 44·0 | 50·3 | 47·5 | 28·900 | 28·715 | 28·745 | 28·864 | ·056 | 28·731 | ·357 | ,, 22–26 |
| Dec. 27–1 | 46·0 | 44·1 | 42·3 | 41·1 | 38·8 | 37·6 | 41·2 | 39·9 | 48·4 | 46·3 | 43·2 | 41·7 | 46·2 | 44·8 | 29·050 | 28·973 | 29·065 | 29·220 | ·054 | 28·904 | ·356 | Dec. 27–1 |
| ,, 2–6 | 46·0 | 43·2 | 39·0 | 37·9 | 37·7 | 36·0 | 38·0 | 36·2 | 44·9 | 42·8 | 38·3 | 36·5 | 41·9 | 39·9 | ·661 | (29·455) | ·322 | ·407 | ·451 | 29·203 | ·583 | ,, 2–6 |
| ,, 7–11 | 43·0 | 39·7 | 35·1 | 34·1 | 36·5 | 34·4 | 36·0 | 33·9 | 42·6 | 40·3 | 37·4 | 35·5 | 39·8 | 37·7 | ·368 | ·072 | ·015 | ·079 | ·186 | 28·832 | ·291 | ,, 7–11 |
| ,, 12–16 | 45·4 | 43·6 | 36·0 | 35·2 | 33·8 | 33·1 | 34·4 | 33·2 | 46·8 | 45·5 | 35·4 | 34·5 | 40·4 | 39·7 | ·632 | ·452 | ·499 | ·638 | ·445 | 29·290 | ·691 | ,, 12–16 |
| ,, 17–21 | 47·3 | 45·3 | 40·6 | 39·6 | 38·8 | 37·4 | 40·0 | 38·3 | 47·9 | 46·2 | 39·6 | 38·4 | 42·1 | 41·1 | ·398 | 29·341 | 29·462 | ·705 | ·372 | 29·213 | ·596 | ,, 17–21 |
| ,, 22–26 | 49·8 | 48·0 | 47·7 | 46·2 | 46·3 | 44·6 | 45·1 | 43·6 | 50·8 | 48·7 | 47·0 | 45·1 | 48·6 | 46·8 | ·009 | 28·898 | 28·952 | ·085 | ·177 | 28·953 | ·525 | ,, 22–26 |
| ,, 27–31 | 46·1 | 43·9 | 42·2 | 40·7 | 41·7 | 40·3 | 41·8 | 40·2 | 46·9 | 44·9 | 44·4 | 43·1 | 46·3 | 44·5 | 29·506 | 29·328 | 29·349 | 29·476 | 29·466 | 29·260 | 29·756 | ,, 27–31 |

NOTE.—The heights in the headings of the temperature columns are those of the thermometer bulbs above the ground. Those in the headings of the pressure columns are those of the barometer cisterns above mean sea level.

Means which are inclosed in brackets are for four days only, owing to various causes, such as clock stopping, defective photography, &c.

* Mean for three days only, 6th and 7th "Trace indistinct."

# APPENDIX Ia.

TABLE I.—MEAN MONTHLY RESULTS from the continuous RECORDS at the SEVEN BRITISH OBSERVATORIES, for the Year 1872.—In Degrees (Celsius) and Millimètres.

## VALENCIA.

| MONTHS. | THERMOMETER. | | | | | BAROMETER. | | | | | PRESSURE. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. Maximum. Day. | Maximum. Ther. | Minimum. Day. | Minimum. Ther. | Means. | Extremes. Maximum. Day. | Maximum. Bar. | Minimum. Day. | Minimum. Bar. | Vap. | Dry Air. |
| | °C. | D. H. | °C. | D. H. | °C. | mm. | D. H. | mm. | D. H. | mm. | mm. | mm. |
| January | 7·61 | 11 23 | 12·00 | 19 21<br>20 18 | 1·50 | 746·67 | 13 23 | 763·46 | 24 2 | *719·34 | 6·32 | 740·35 |
| February | 8·50 | 28 1 | 11·83 | 3 9 | 3·78 | 50·05 | 26 20<br>22 | 64·37 | 24 16 | 36·23 | 6·73 | 43·32 |
| March | 8·61 | 16 2 | 13·17 | 25 16 | **−0·33** | 53·33 | 18 13 | 66·81 | 28 3 | 33·82 | 6·78 | 46·55 |
| April | 9·22 | 14 3 | 15·50 | 3 18 | 1·17 | 60·39 | 8 12 | 70·91 | 22 21 | 38·92 | 6·88 | 53·51 |
| May | 10·39 | 14 3 | 18·22 | 9 16 | 4·44 | 61·27 | 26 10 | **73·06** | 6 16 | 46·24 | 7·14 | 54·13 |
| June | 12·89 | 20 5 | 19·00 | 5 16 | 7·22 | 57·85 | 4 0 | 67·65 | 8 15 | 43·07 | 9·22 | 48·63 |
| July | 15·39 | 24 6 | 20·94 | 6 14 | 9·22 | 58·23 | 4 0 | 66·50 | 26 4 | 48·98 | 11·07 | 47·16 |
| August | 15·33 | 19 0 | **24·17** | 12 17 | 8·78 | 60·39 | 27 9 | 70·93 | 9 16 | 41·80 | 10·36 | 50·03 |
| September | 14·00 | 5 5 | 20·00 | 24 18 | 6·67 | 57·56 | 13 7<br>8 | 70·09 | 4 10 | 39·89 | 9·88 | 47·68 |
| October | 9·78 | 6 18 | 14·50 | 4 18 | 3·33 | 53·58 | 4 20<br>21 | 70·77 | 24 15 | 25·66 | 7·21 | 46·37 |
| November | 8·28 | 6 0 | 15·00 | 13 20 | 0·11 | 50·89 | 10 10 | 72·38 | 22 19 | **18·82** | 6·68 | 44·21 |
| December | 7·94 | 22 0 | 12·22 | 11 19 | 0·78 | 747·18 | 3 23 | 763·44 | 24 2 | 723·43 | 6·63 | 740·55 |
| Annual | 10·66 | .. | .. | .. | .. | 754·78 | .. | .. | .. | .. | 7·91 | 746·87 |

* Doubtful, clock stopped during the next two hours.

## ARMAGH.

| | °C. | D. H. | °C. | D. H. | °C. | mm. | D. H. | mm. | D. H. | mm. | mm. | mm. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 4·72 | 29 4<br>31 2 | 11·39 | 20 21 | **−3·33** | 740·83 | 11 15<br>26 22 | 756·40 | 17 13 | **712·54** | 5·71 | 735·12 |
| February | 6·61 | 24 4 | 11·50 | 26 19 | 0·00 | 46·64 | 26 22 | 62·32 | 1 10 | 33·23 | 6·22 | 40·42 |
| March | 6·44 | 4 2 | 14·67 | 25 19 | −2·83 | 48·96 | 9 21 | 62·07 | 28 7 | 31·99 | 6·04 | 42·92 |
| April | 7·94 | 10 1 | 16·06 | 2 18 | −0·17 | 54·60 | 5 12 | 66·38 | 23 5 | 34·94 | 6·43 | 48·17 |
| May | 9·00 | 26 2 | 16·89 | 11 17 | 0·67 | 54·21 | 10 11 | **66·62** | 3 18 | 33·89 | 6·95 | 47·26 |
| June | 12·83 | 16 3 | 21·94 | 5 14 | 5·00 | 51·40 | 15 21 | 62·19 | 8 17 | 36·62 | 9·09 | 42·31 |
| July | 15·56 | 20 2 | **23·11** | 16 17 | 7·61 | 54·37 | 4 1 | 61·17 | 10 7 | 47·71 | 10·46 | 43·91 |
| August | 14·44 | 22 3 | 21·94 | 31 17 | 8·06 | 55·16 | 27 8 | 64·76 | 10 0<br>1 | 40·43 | 10·49 | 44·67 |
| September | 12·00 | 13 2 | 22·50 | 25 18 | 3·89 | 50·40 | 13 23 | 62·09 | 27 22 | 37·91 | 9·14 | 41·26 |
| October | 7·44 | 1 2 | 14·94 | 4 18 | −0·39 | 47·23 | 4 22 | 65·62 | 24 5<br>6 | 29·67 | 6·73 | 40·50 |
| November | 5·89 | 6 1 | 16·44 | 24 19 | −1·11 | 44·71 | 12 9 | 66·10 | 23 8 | 16·91 | 6·04 | 38·67 |
| December | 4·56 | 22 1 | 11·33 | 11 21 | −2·28 | 742·78 | 3 23<br>11 22 | 757·24 | 24 18<br>19 | 721·60 | 5·68 | 737·10 |
| Annual | 8·95 | .. | .. | .. | .. | 749·27 | .. | .. | .. | .. | 7·42 | 741·86 |

Table I.—Mean Monthly Results, &c.—*continued.*

GLASGOW.

| Months. | Thermometer. | | | | | | Barometer. | | | | | Pressure. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. Maximum. Day. | Maximum. Ther. | Minimum. Day. | Minimum. Ther. | Means. | Extremes. Maximum. Day. | Maximum. Bar. | Minimum. Day. | Minimum. Bar. | Vap. | Dry Air. |
| | °C. | D. H. | °C. | D. H. | °C. | mm. | D. H. | mm. | D. H. | mm. | mm. | mm. |
| January | 4·78 | 31 4 | 11·22 | 9 14 | −1·44 | 740·95 | 9 16 | 756·45 | 17 13 | ***713·65** | 5·53 | 735·42 |
| February | 5·56 | 13 2 | 10·00 | 7 19<br>26 19 | −1·11 | 48·37 | 26 21<br>22 | 62·27 | 1 14 | 34·25 | 5·81 | 42 56 |
| March | 5·61 | 7 2 | 14·78 | 25 18 | **−3·61** | 49·67 | 9 21 | 62·98 | 28 9<br>10 | 33·77 | 5·51 | 44 16 |
| April | 7·61 | 12 0 | 15·06 | 18 16<br>18 | 0·39 | 54·24 | 5 12<br>13<br>20 | 67·32 | 23 4 | 38·92 | 5·76 | 48·48 |
| May | 8·61 | 26 4 | 16·11 | 20 17 | 0·50 | 53·18 | 10 9<br>10 | 65·62 | 4 1 | 28·64 | 6·40 | 46·78 |
| June | 12·67 | 18 2 | **23·94** | 3 12 | 5·50 | 50·81 | 16 10 | 62·90 | 9 17 | 38·11 | 8·66 | 42·15 |
| July | 15·17 | 28 4 | **23·94** | 9 17 | 7·06 | 54·92 | 4 0 | 61·15 | 8 4 | 48·17 | 9·98 | 44·94 |
| August | 13·56 | 19 4 | 22·83 | 13 16 | 6·11 | 55·36 | 13 20<br>22 | 64·17 | 10 5 | 42·05 | 9·59 | 45·77 |
| September | 10·89 | 4 3 | 18·44 | 21 15 | 2·22 | 49·11 | 13 20 | 61·02 | 28 3 | 32·19 | 8·32 | 40·79 |
| October | 7·72 | 1 1 | 14·22 | 4 20 | −2·06 | 46·98 | 4 21<br>22 | 65·47 | 23 19 | 32·14 | 6·48 | 40·50 |
| November | 5·56 | 6 2 | 15·44 | 18 22 | −1·22 | 44·69 | 12 23 | **67·35** | 23 11 | 17·97 | 5·66 | 39·03 |
| December | 3·94 | 26 18 | 10·61 | 11 19 | −3·56 | 743·27 | 3 23 | 756·37 | 24 20 | 723·05 | 5·36 | 737·91 |
| Annual | 8·47 | .. | .. | .. | .. | 749·29 | .. | .. | .. | .. | 6·92 | 742·37 |

* Doubtful, the trace not being visible from 13 hrs. to 21 hrs.

ABERDEEN.

| | °C. | D. H. | °C. | D. H. | °C. | mm. | D. H. | mm. | D. H. | mm. | mm. | mm. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 4·44 | 30 2 | 9·94 | 9 17<br>27 21 | −0·94 | 743·39 | 27 22 | 759·88 | 17 20 | **713·15** | 5·51 | 737·88 |
| February | 5·11 | 29 2 | 11·94 | 7 21 | −0·44 | 52·16 | 26 23 | 63·84 | 1 17 | 38·75 | 5·76 | 46·40 |
| March | 5·00 | 16 2 | 12·89 | 20 20 | −1·67 | 52·56 | 9 20 | 65·88 | 28 11 | 37·65 | 5·41 | 47·15 |
| April | 7·17 | 14 2 | 15·06 | 20 10 | 1·11 | 56·24 | 5 11 | 70·11 | 22 16 | 44·18 | 5·99 | 50·25 |
| May | 8·56 | 26 4 | 18·33 | 17 16<br>18 16 | 1·56 | 55·26 | 10 9 | 68·13 | 4 3 | 31·43 | 6·48 | 48·78 |
| June | 12·17 | 17 21 | 18·39 | 3 13 | 6·22 | 53·78 | 16 2 | 65·67 | 8 16 | 41·31 | 8·83 | 44·95 |
| July | 14·17 | 4 1<br>22 | **23·61** | 16 16 | 7·06 | 58·10 | 25 8 | 64·12 | 8 13<br>14 | 48·93 | 9·93 | 48·17 |
| August | 12·78 | 19 2 | 18·78 | 5 17 | 4·61 | 58·58 | 18 11 | 67·77 | 10 18 | 45·10 | 9·32 | 49·26 |
| September | 10·56 | 12 3 | 19·28 | 22 13 | 2·28 | 50·69 | 13 22 | 62·75 | 28 3 | 31·05 | 7·95 | 42·74 |
| October | 8·11 | 2 2 | 14·33 | 4 18 | 0·72 | 48·67 | 4 22 | 67·91 | 30 11<br>17<br>18 | 34·60 | 6·70 | 41·97 |
| November | 6·17 | 6 3 | 16·11 | 27 20 | −0·44 | 47·35 | 12 21 | **71·41** | 23 13 | 21·78 | 5·87 | 41·48 |
| December | 4·06 | 27 5 | 9·56 | 4 19 | **−2·94** | 746·59 | 21 15 | 759·09 | 24 22 | 727·11 | 5·36 | 741·23 |
| Annual | 8·19 | .. | .. | .. | .. | 751·95 | .. | .. | .. | .. | 6·93 | 745·02 |

Table I.—Mean Monthly Results, &c.—*continued.*

FALMOUTH.

| Months. | Thermometer. | | | | | Barometer. | | | | | Pressure. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. Maximum. | | Extremes. Minimum. | | Means. | Extremes. Maximum. | | Extremes. Minimum. | | Vap. | Dry Air. |
| | | Day. | Ther. | Day. | Ther. | | Day. | Bar. | Day. | Bar. | | |
| | °C. | D. H. | °C. | D. H. | °C. | mm. | D. H. | mm. | D. H. | mm. | mm. | mm. |
| January - | 7·78 | 4 10 | 11·78 | 19 16 | 2·78 | 745·73 | 11 17 | 760·15 | 23 12 | **716·14** | 6·68 | 739·05 |
| February - | 8·67 | 29 1 | 13·06 | 20 20 | 4·67 | 49·67 | 27 0 | 61·56 | 1 8 | 37·75 | 7·19 | 42·48 |
| March - | 8·33 | 16 2 | 13·94 | 22 18 | **0·39** | 50·69 | 10 0 | 64·81 | 30 3 | 34·23 | 6·70 | 43·99 |
| April - | 9·00 | 15 3 | 14·89 | 19 16 | 2·67 | 55·07 | 5 22<br>6 9 | **68·92** | 21 19 | 27·54 | 6·63 | 48·44 |
| May - | 10·22 | 28 2 | 17·28 | 11 16 | 2·56 | 55·46 | 26 19<br>20 | 67·65 | 6 19 | 42·88 | 7·34 | 48·12 |
| June - | 13·61 | 17 1 | 21·22 | 6 17 | 7·78 | 54·90 | 16 0 | 64·45 | 8 19 | 39·92 | 9·54 | 45·36 |
| July - | 16·39 | 21 2 | **21·89** | 7 17 | 12·33 | 54·95 | 4 0 | 64·53 | 29 15 | 47·69 | 11·61 | 43·34 |
| August - | 15·94 | 21 0 | 21·67 | 12 16 | 10·56 | 56·32 | 27 10 | 65·67 | 5 2 | 42·71 | 10·81 | 45·51 |
| September | 14·33 | 14 23 | 20·50 | 22 19 | 6·50 | 54·01 | 12 22 | 66·76 | 23 20 | 41·21 | 10·10 | 43·91 |
| October - | 10·06 | 2 1 | 16·44 | 13 19 | 4·72 | 48·98 | 6 9<br>10 | 65·29 | 25 2 | 31·96 | 7·77 | 41·21 |
| November | 8·83 | 5 23 | 14·06 | 12 20 | 2·50 | 48·52 | 7 9 | 67·25 | 30 4<br>5 | 20·11 | 7·11 | 41·41 |
| December | 8·17 | 22 1 | 12·72 | 11 20 | 1·50 | 745·15 | 4 12 | 757·75 | 24 15<br>17 | 728·71 | 6·95 | 738·20 |
| Annual - | 10·94 | .. | .. | .. | .. | 751·62 | .. | .. | .. | .. | 8·20 | 743·42 |

STONYHURST.

| | °C. | D. H. | °C. | D. H. | °C. | mm. | D. H. | mm. | D. H. | mm. | mm. | mm. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January - | 4·78 | 30 2 | 12·17 | 9 16 | −1·56 | 738·92 | 11 23 | 754·11 | 23 20 | **712·35** | 5·61 | 733·31 |
| February - | 6·28 | 10 2 | 11·56 | 16 10 | 2·39 | 45·12 | 26 23 | 57·61 | 1 14 | 33·84 | 6·02 | 39·10 |
| March - | 6·33 | 6 3 | 14·78 | 25 17 | **−5·50** | 45·66 | 9 22 | 59·60 | 27 15 | 27·42 | 5·73 | 39·93 |
| April - | 7·61 | 12 0 | 17·11 | 19 15 | 0·17 | 49·92 | 5 19<br>20 | **64·17** | 21 16 | 30·57 | 6·07 | 43·85 |
| May - | 9·06 | 1 3 | 17·83 | 18 15 | 1·56 | 49·18 | 26 10 | 61·51 | 4 1 | 32·24 | 6·63 | 42·55 |
| June - | 13·28 | 18 0 | 26·22 | 6 15 | 2·89 | 47·86 | 15 23 | 59·42 | 9 7 | 31·05 | 9·09 | 38·77 |
| July - | 16·39 | 21 4 | **27·61** | 30 16 | 6·50 | 50·33 | 3 23 | 58·26 | 7 22 | *44·54 | 10·71 | 39·62 |
| August - | 14·67 | 18 3 | 25·44 | 31 18 | 8·72 | 51·01 | 27 11 | 60·08 | 10 6 | 36·59 | 9·93 | 41·08 |
| September | 12·50 | 4 3 | 21·89 | 21 18 | 2·28 | 45·88 | 12 22 | 58·63 | 28 2 | 34·89 | 8·81 | 37·07 |
| October - | 7·94 | 2 2 | 14·89 | 14 19 | −0·78 | 43·07 | 5 20 | 60·29 | 10 9 | 27·11 | 6·75 | 36·32 |
| November | 6·28 | 6 3 | 16·06 | 18 20 | −2·72 | 41·44 | 12 9 | 59·17 | 30 13 | 19·19 | 5·97 | 35·47 |
| December | 4·67 | 22 7 | 10·22 | 4 20<br>11 16 | −3·56 | 739·63 | 4 9<br>10 | 751·55 | 8 12 | 713·30 | 5·58 | 734·05 |
| Annual - | 9·15 | .. | .. | .. | .. | 745·67 | .. | .. | .. | .. | 7·24 | 738·43 |

* This is the lowest reading recorded, but the trace being indistinct on the 6th and 7th, it is doubtful whether this is the minimum or not.

Table I.—Mean Monthly Results, &c.—*continued.*

KEW.

| Months. | Thermometer. | | | | | | Barometer. | | | | | | Pressure. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Means. | Extremes. | | | | | Means. | Extremes. | | | | | Vap. | Dry Air. |
| | | Maximum. | | Minimum. | | | | Maximum. | | Minimum. | | | | |
| | | Day. | Ther. | Day. | Ther. | | | Day. | Bar. | Day. | Bar. | | | |
| | ° C. | D. H. | ° C. | D. H. | ° C. | | mm. | D. H. | mm. | D. H. | mm. | | mm. | mm. |
| January - | 5·50 | 4 16 | 11·44 | 14 21 | **−3·33** | | 751·83 | 11 23 | 766·18 | 23 17 | **719·06** | | 5·94 | 745·89 |
| February - | 7·28 | 10 2 | 13·33 | 21 14 | 0·17 | | 56·73 | 27 10 | 67·20 | 25 18 | 48·30 | | 6·45 | 50·28 |
| March - | 7·11 | 7 1 | 15·39 | 25 17 | −2·56 | | 56·22 | 9 21<br>22 | 70·01 | 30 3 | 42·56 | | 6·12 | 50·10 |
| April - | 9·17 | 27 2 | 19·33 | 19 18 | −1·33 | | 59·53 | 5 22 | **74·05** | 21 5 | 37·24 | | 6·48 | 53·05 |
| May - | 10·56 | 27 6 | 21·33 | 19 16 | 0·28 | | 59·04 | 26 20 | 71·01 | 6 23 | 45·81 | | 7·19 | 51·85 |
| June - | 15·39 | 18 3 | *28·56 | 6 16 | 5·89 | | 58·88 | 15 20 | 68·84 | 9 5 | 46·01 | | 9·59 | 49·29 |
| July - | 18·39 | 25 3 | **31·44** | 30 17 | 8·61 | | 59·53 | 3 19 | 67·57 | 29 18 | 52·41 | | 11·25 | 48·28 |
| August - | 16·06 | 17 3 | 27·28 | 27 17 | 7·67 | | 60·64 | 27 19 | 69·79 | 5 7 | 47·81 | | 10·16 | 50·48 |
| September | 14·22 | 3 3 | 27·28 | 22 ? | †0·83 | | 57·59 | 12 22 | 69·53 | 24 1 | 45·25 | | 9·49 | 48·10 |
| October - | 8·89 | 2 3 | 17·50 | 13 18 | −1·00 | | 53·86 | 6 10 | 70·91 | 24 11 | 40·58 | | 7·41 | 46·45 |
| November | 7·67 | 4 23 | 15·61 | 17 15 | 0·28 | | 52·94 | 7 10 | 71·46 | 30 11 | 31·91 | | 6·68 | 46·26 |
| December | 6·22 | 22 2 | 11·72 | 11 20 | −1·44 | | 750·96 | 4 21 | 761·96 | 10 6 | 730·64 | | 6·27 | 744·69 |
| Annual - | 10·54 | .. | .. | .. | .. | | 756·48 | .. | .. | .. | .. | | 7·75 | 748·73 |

* Doubtful, trace being scarcely discernible through zero line from 0 to 6 hrs. on 17th, when readings were very high.
† Reading of a minimum thermometer, the curve being indistinct.

## TABLE II.—Part 1.

**Five-Day Means of the Dry and Wet Bulb Thermometers and Barometer, from the continuous Records at the Seven British Observatories, January to June 1872.**

| Five-Day Periods. | Thermometers. Valencia. 3·65 m. Dry. | Valencia. 3·65 m. Wet. | Armagh. 1·22 m. Dry. | Armagh. 1·22 m. Wet. | Glasgow. 2·13 m. Dry. | Glasgow. 2·13 m. Wet. | Aberdeen. 12·50 m. Dry. | Aberdeen. 12·50 m. Wet. | Falmouth. 3·35 m. Dry. | Falmouth. 3·35 m. Wet. | Stonyhurst. 2·13 m. Dry. | Stonyhurst. 2·13 m. Wet. | Kew. 3·05 m. Dry. | Kew. 3·05 m. Wet. | Barometer. Valencia. 7·01 m. | Armagh. 63·09 m. | Glasgow. 56·08 m. | Aberdeen. 26·82 m. | Falmouth. 64·31 m. | Stonyhurst. 110·03 m. | Kew. 10·36 m. | Five-Day Periods. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | ° c. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | |
| Jan. 1–5 | 6·94 | 5·11 | 3·56 | 2·67 | 4·06 | 2·89 | 3·94 | 2·67 | 7·78 | 6·39 | 4·44 | 3·56 | 6·39 | 5·17 | 743·88 | 736·94 | 736·16 | 738·01 | 744·84 | 735·87 | 751·01 | Jan. 1–5 |
| ,, 6–10 | 7·39 | 5·78 | 3·28 | 2·72 | 2·11 | 1·39 | 2·50 | 1·78 | 6·78 | 5·44 | 2·50 | 1·78 | 3·61 | 2·83 | 50·91 | 46·75 | 43·52 | 45·61 | 48·27 | 40·55 | 52·41 | ,, 6–10 |
| ,, 11–15 | 8·56 | 7·06 | 5·78 | 4·94 | 5·72 | 4·83 | 5·00 | 4·11 | 7·89 | 6·83 | 5·28 | 4·61 | 4·89 | 4·22 | 56·63 | 50·02 | 49·32 | 51·19 | 55·77 | 47·99 | 60·97 | ,, 11–15 |
| ,, 16–20 | 6·50 | 5·33 | 4·39 | 3·61 | 5·06 | 4·17 | 4·61 | 3·61 | 6·78 | 5·50 | 4·06 | 3·22 | 4·83 | 4·00 | 43·83 | 36·31 | 35·01 | 36·38 | 42·58 | 34·73 | 48·37 | ,, 16–20 |
| ,, 21–25 | 7·06 | 5·78 | 3·72 | 3·33 | (3·67) | 3·00 | 4·50 | 3·94 | 8·06 | 6·94 | 4·56 | 3·78 | 6·44 | 5·67 | 33·94 | 31·00 | 33·43 | 37·73 | 30·77 | 28·00 | 39·21 | ,, 21–25 |
| ,, 26–30 | 8·83 | 7·56 | 6·83 | 5·89 | *9·22 | 5·83 | 5·44 | 4·78 | 8·72 | 7·89 | 6·89 | 6·00 | 6·50 | 5·78 | 52·43 | 48·10 | 48·98 | 51·91 | 52·18 | 46·24 | 58·18 | ,, 26–30 |
| Feb. 31–4 | 8·06 | 6·39 | 6·89 | 5·61 | 7·11 | 5·56 | 6·67 | 5·72 | 8·83 | 7·78 | 6·94 | 5·72 | 7·22 | 6·11 | 43·83 | 41·03 | 43·44 | 47·43 | 46·59 | 42·46 | 55·69 | Feb. 31–4 |
| ,, 5–9 | 9·06 | 7·67 | 7·06 | 5·94 | 5·33 | 4·44 | 5·33 | 4·61 | 9·22 | 8·33 | 6·89 | 5·78 | 8·33 | 7·33 | 50·13 | 48·37 | 50·61 | 54·21 | 51·09 | 47·33 | 58·61 | ,, 5–9 |
| ,, 10–14 | 8·61 | 7·17 | 7·67 | 6·67 | 6·72 | 5·56 | 5·67 | 5·00 | 9·11 | 8·17 | 7·11 | 6·00 | 7·83 | 6·72 | 45·91 | (46·44) | 49·89 | 55·56 | 44·91 | 45·10 | 55·07 | ,, 10–14 |
| ,, 15–19 | 7·44 | 5·56 | 5·00 | 4·00 | 4·39 | 3·44 | 4·00 | 3·11 | 7·67 | 6·61 | 4·78 | 3·67 | 6·39 | 5·28 | 53·20 | 45·48 | 45·32 | 48·42 | 50·59 | 43·09 | 55·41 | ,, 15–19 |
| ,, 20–24 | 8·56 | 7·33 | 6·78 | 5·83 | 5·33 | 4·72 | 4·72 | 3·94 | 8·72 | 7·67 | 6·50 | 5·56 | 7·11 | 6·06 | 50·56 | 46·34 | 48·07 | 51·93 | 51·37 | 45·10 | 57·67 | ,, 20–24 |
| ,, 25–1 | 9·61 | 8·61 | 7·11 | 6·11 | 5·44 | 4·33 | 5·06 | 3·89 | 9·00 | 7·89 | 6·44 | 5·28 | 7·33 | 6·11 | 54·42 | 50·15 | 51·09 | 53·89 | 53·10 | 46·90 | 58·10 | ,, 25–1 |
| March 2–6 | 10·78 | 9·56 | 10·22 | 8·67 | (9·94) | (7·89) | 8·33 | 7·22 | 10·61 | 9·56 | 9·44 | 7·67 | 9·50 | 7·94 | 52·84 | 51·26 | 53·33 | 56·04 | 53·91 | 51·16 | 62·69 | March 2–6 |
| ,, 7–11 | 8·50 | 7·17 | 7·11 | 6·06 | 6·94 | 5·50 | 5·67 | 4·72 | 8·11 | 6·61 | 7·56 | 5·61 | 6·83 | 5·33 | 56·55 | 51·06 | 51·50 | 54·45 | 54·55 | 49·06 | 59·85 | ,, 7–11 |
| ,, 12–16 | 9·67 | 8·44 | 8·11 | 7·06 | 7·78 | 6·61 | 7·11 | 6·06 | 9·22 | 8·06 | 7·56 | 6·28 | 8·50 | 7·00 | 52·48 | 46·98 | 47·91 | 50·91 | 51·45 | 45·68 | 57·09 | ,, 12–16 |
| ,, 17–21 | 8·06 | 6·28 | 4·67 | 3·06 | 4·11 | 2·50 | 3·33 | 1·94 | 6·72 | 4·94 | 3·89 | 2·22 | 4·72 | 3·17 | 62·85 | 56·09 | 54·26 | 55·79 | 55·64 | 48·72 | 57·70 | ,, 17–21 |
| ,, 22–26 | 4·50 | 2·33 | 1·94 | 0·94 | 1·44 | 0·11 | 1·61 | 0·56 | 3·89 | 2·06 | 1·06 | −0·11 | 1·56 | 0·67 | 54·77 | 50·76 | 51·19 | 53·86 | 48·05 | 44·61 | 52·84 | ,, 22–26 |
| ,, 27–31 | 9·83 | 8·56 | 6·00 | 5·44 | 3·89 | 2·89 | 3·94 | 2·50 | 10·83 | 9·89 | 8·17 | 7·28 | 10·83 | 9·67 | 40·09 | 36·99 | 39·13 | 43·39 | 39·61 | 33·94 | 46·44 | ,, 27–31 |
| April 1–5 | 8·17 | 6·17 | 5·67 | 4·22 | 5·00 | 2·94 | 4·33 | 3·22 | 7·44 | 5·61 | 5·11 | 3·56 | 6·78 | 5·39 | 62·04 | 56·22 | 56·09 | 58·10 | 55·28 | 49·94 | 58·00 | April 1–5 |
| ,, 6–10 | 10·72 | 10·06 | 10·22 | 8·67 | 9·22 | 7·33 | 8·39 | 6·61 | 9·94 | 8·72 | 8·61 | 7·11 | 9·33 | 7·44 | 67·20 | 60·24 | 58·81 | 59·63 | 64·53 | 56·83 | 68·01 | ,, 6–10 |
| ,, 11 15 | 9·61 | 7·78 | 8·78 | 7·22 | 9·06 | 7·00 | 9·72 | 7·00 | 10·44 | 8·39 | 9·06 | 7·22 | 11·50 | 8·50 | 65·13 | 58·56 | 56·37 | 56·60 | 59·24 | 53·48 | 63·56 | ,, 11–15 |
| ,, 16–20 | 8·11 | 5·50 | 5·44 | 3·61 | 5·22 | 2·33 | 4·50 | 2·89 | 7·39 | 4·89 | 5·00 | 2·83 | 6·17 | 4·00 | 60·54 | 54·80 | 53·96 | 55·61 | 52·03 | 47·74 | 55·36 | ,, 16–20 |
| ,, 21–25 | 8·22 | 6·67 | 7·11 | 5·83 | 6·89 | 5·39 | 6·56 | 5·67 | 8·11 | 6·83 | 7·72 | 6·28 | 9·56 | 7·72 | 44·08 | 39·92 | 42·46 | 47·54 | 39·07 | 36·79 | 47·71 | ,, 21–25 |
| ,, 26–30 | 10·61 | 9·06 | 10·44 | 9·00 | 10·17 | 8·28 | 9·56 | 8·11 | 10·50 | 8·89 | 10·11 | 8·33 | 11·67 | 9·50 | 63·39 | 57·80 | 57·75 | 59·95 | 60·24 | 54·77 | 64·45 | ,, 26–30 |
| May 1–5 | 10·50 | 9·00 | 9·94 | 8·39 | 9·17 | 7·39 | 9·50 | 7·72 | 10·72 | 9·00 | 9·78 | 8·33 | 11·89 | 9·33 | 58·23 | 49·26 | 47·28 | 48·88 | 55·36 | 46·08 | 58·38 | May 1–5 |
| ,, 6–10 | 9·33 | 7·00 | 7·61 | 6·17 | 7·39 | 5·39 | 6·78 | 5·00 | 9·50 | 7·44 | 7·33 | 5·61 | 8·61 | 6·94 | 58·91 | 50·20 | 49·16 | 51·83 | 52·33 | 44·36 | 54·72 | ,, 6–10 |
| ,, 11–15 | 11·06 | 8·67 | 8·39 | 7·28 | 8·33 | 6·89 | 8·17 | 7·22 | 8·67 | 7·22 | 8·61 | 6·72 | 8·72 | 7·28 | 61·27 | 56·99 | 57·77 | 61·45 | 53·68 | 50·50 | 57·72 | ,, 11–15 |
| ,, 16–20 | 8·78 | 6·72 | 6·94 | 5·50 | 6·50 | 4·56 | 6·17 | 4·28 | 9·61 | 7·78 | 7·17 | 4·94 | 8·39 | 6·83 | 56·75 | 51·19 | 50·33 | 52·03 | 48·98 | 45·56 | 54·50 | ,, 16–20 |
| ,, 21–25 | 10·17 | 8·28 | 9·11 | 7·78 | 9·11 | 7·28 | 8·83 | 7·33 | 9·78 | 8·11 | 9·33 | 7·44 | 10·67 | 8·17 | 64·27 | 57·26 | 55·53 | 57·56 | 58·33 | 51·98 | 61·93 | ,, 21–25 |
| ,, 26–30 | 12·22 | 10·61 | 12·06 | 10·28 | 11·00 | 9·11 | 11·89 | 9·33 | 12·72 | 11·33 | 11·94 | 10·17 | 15·11 | 12·44 | 67·35 | 59·60 | 58·28 | 59·27 | 63·03 | 55·89 | 66·25 | ,, 26–30 |
| June 31–4 | 11·44 | 9·56 | 10·22 | 8·89 | 10·17 | 8·22 | 10·11 | 8·56 | 11·83 | 9·78 | 10·50 | 8·56 | 11·78 | 9·61 | 63·61 | 54·77 | 53·38 | 55·82 | 58·41 | 50·23 | 60·82 | June 31–4 |
| ,, 5–9 | 10·33 | 8·44 | 9·61 | 8·17 | 10·11 | 8·44 | 10·11 | 9·44 | 11·39 | 9·83 | 9·67 | 8·28 | 12·22 | 10·56 | 52·84 | 45·20 | 45·37 | 48·98 | 49·01 | 41·36 | 53·91 | ,, 5–9 |
| ,, 10–14 | 13·17 | 12·22 | 13·17 | 11·67 | 12·56 | 11·00 | 12·33 | 10·72 | 13·28 | 11·89 | 12·83 | 11·50 | 14·78 | 12·56 | (56·45) | 50·96 | 50·40 | 52·51 | 54·57 | 47·30 | 57·95 | ,, 10–14 |
| ,, 15–19 | 14·72 | 13·78 | 16·56 | 15·00 | 16·06 | 14·67 | 14·44 | 13·39 | 16·22 | 14·72 | 18·11 | 16·06 | 20·50 | 17·28 | 61·37 | 56·70 | 55·28 | 60·56 | 58·51 | 53·60 | (64·12) | ,, 15–19 |
| ,, 20–24 | 13·89 | 12·50 | 13·83 | 12·06 | 13·67 | 11·56 | 13·00 | 11·50 | 14·44 | 13·00 | 14·72 | 12·44 | 17·06 | 13·89 | 57·56 | 52·06 | 52·06 | 54·92 | 55·36 | 49·32 | 60·05 | ,, 20–24 |
| ,, 25–29 | 13·17 | 11·50 | 12·78 | 11·00 | 12·22 | 10·33 | 12·33 | 10·50 | 14·00 | 12·33 | 12·67 | 10·89 | 14·89 | 12·33 | 757·51 | 750·71 | 749·57 | 750·76 | 755·16 | 746·83 | 758·46 | ,, 25–29 |

Note.—The heights in the headings of the temperature columns are those of the thermometer bulbs above the ground. Those in the headings of the pressure columns are those of the barometer cisterns above mean sea-level.

Means which are enclosed in brackets are for four days only, owing to various causes, such as clock stopping, defective photography, &c. Owing to leap year, the period Feb. 25th to March 1st contains *six days*.

* Mean for two days only, viz., Jan. 29th and 30th.

## TABLE II.—PART 2.

FIVE-DAY MEANS of the DRY and WET BULB THERMOMETERS and BAROMETER, from the continuous Records at the Seven BRITISH OBSERVATORIES, July to December 1872.

| Five-Day Periods. | THERMOMETERS. Valencia. 3·06 m. | | Armagh. 1·22 m. | | Glasgow. 2·13 m. | | Aberdeen. 12·50 m. | | Falmouth. 3·35 m. | | Stonyhurst. 2·13 m. | | Kew. 3·05 m. | | BAROMETER. Valencia. 7·01 m. | Armagh. 63·09 m. | Glasgow. 56·08 m. | Aberdeen. 26·82 m. | Falmouth. 64·31 m. | Stonyhurst. 110·03 m. | Kew. 10·36 m. | Five-Day Periods. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | Dry. | Wet. | | | | | | | | |
| | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | ° C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | |
| June 30–4 | 14·50 | 13·39 | 15·61 | 13·78 | 15·50 | 13·17 | 14·94 | 13·06 | 15·22 | 13·72 | 15·72 | 13·22 | 17·50 | 14·11 | 761·20 | 755·64 | (757·51) | 757·92 | 759·45 | 752·67 | 763·00 | June 30–4 |
| July 5–9 | 13·78 | 12·39 | 14·11 | 12·17 | 13·44 | 11·72 | 14·33 | 12·89 | 15·17 | 13·89 | 15·33 | 13·61 | 18·56 | (15·28) | 58·97 | 53·70 | 53·33 | 55·79 | 54·14 | *49·01 | 57·85 | July 5–9 |
| ,, 10–14 | 15·00 | 13·72 | (15·17) | (13·56) | 15·89 | 13·83 | 13·33 | 12·39 | 15·72 | 14·33 | 15·56 | 13·94 | 17·00 | 14·56 | 57·97 | 54·11 | 55·21 | 59·88 | 53·50 | 49·03 | 58·23 | ,, 10–14 |
| ,, 15–19 | 15·61 | 14·00 | 14·44 | 12·56 | 14·59 | 11·28 | 12·83 | 10·28 | 16·67 | 14·89 | 15·22 | 12·89 | 16·28 | 13·89 | 59·93 | 55·43 | 55·26 | 58·10 | 56·68 | 51·14 | 60·80 | ,, 15–19 |
| ,, 20–24 | 16·33 | 15·17 | 17·17 | 15·28 | 17·11 | 15·39 | 15·94 | 14·56 | 17·67 | 16·11 | 19·11 | 16·72 | 21·39 | 18·56 | 56·37 | 52·89 | 53·96 | 57·14 | 54·40 | 49·92 | 59·37 | ,, 20–24 |
| ,, 25–29 | 16·56 | 15·39 | 16·94 | 15·44 | 15·72 | 14·44 | 14·17 | 13·56 | 17·28 | 16·11 | 19·06 | 16·72 | 20·83 | 17·61 | 52·99 | 52·82 | 54·90 | 59·27 | 51·47 | 48·98 | 57·97 | ,, 25–29 |
| Aug. 30–3 | 14·78 | 13·06 | 12·83 | 11·11 | 12·67 | 10·28 | 11·56 | 9·61 | 15·56 | 13·61 | 12·61 | 10·44 | 14·78 | 12·44 | 58·86 | 53·48 | 53·20 | 55·87 | 52·62 | 47·91 | 56·53 | Aug. 30–3 |
| ,, 4–8 | 14·94 | 13·28 | (13·61) | (12·33) | 12·72 | 11·17 | 11·44 | 9·72 | 15·28 | 13·89 | 14·00 | 12·28 | 15·50 | 13·83 | 53·30 | 49·11 | 49·77 | 53·60 | 49·49 | 44·71 | 53·89 | ,, 4–8 |
| ,, 9–13 | 14·33 | 12·61 | 13·44 | 12·22 | 13·50 | 12·00 | 13·11 | 12·00 | 14·78 | 12·72 | 13·94 | 12·67 | 15·44 | 12·94 | 61·42 | 53·96 | 52·64 | 55·48 | 57·44 | 48·91 | 60·82 | ,, 9–13 |
| ,, 14–18 | 16·72 | (14·67) | 16·11 | 14·78 | 14·67 | 13·39 | 14·17 | 13·39 | 17·22 | (15·44) | 16·39 | 14·06 | 17·17 | (14·06) | 61·05 | 58·21 | 59·93 | 63·76 | 59·19 | 56·40 | 65·83 | ,, 14–18 |
| ,, 19–23 | 16·06 | 14·17 | 16·61 | 14·83 | 15·06 | 13·28 | 12·94 | 11·83 | 17·39 | 15·83 | 16·28 | 13·83 | 18·17 | 15·33 | 63·54 | 59·80 | 61·48 | 65·39 | 57·95 | 55·72 | 63·10 | ,, 19–23 |
| ,, 24–28 | 15·50 | 14·06 | 14·78 | 13·50 | 13·39 | 12·06 | 13·06 | 12·00 | 16·00 | 14·17 | 14·89 | 13·11 | 16·00 | 13·39 | 65·69 | 58·88 | 58·31 | 60·80 | 61·27 | 54·52 | 64·35 | ,, 24–28 |
| Sept. 29–2 | 15·22 | 13·72 | 12·39 | 11·72 | 11·50 | 10·22 | 11·33 | 10·00 | 15·83 | 14·39 | 13·50 | 12·11 | 15·72 | 13·67 | 54·77 | 50·35 | 50·89 | 53·91 | 52·56 | 46·67 | 57·61 | Sept. 29–2 |
| ,, 3–7 | 15·78 | 14·28 | 14·78 | 13·78 | 14·17 | 13·44 | 13·94 | 13·11 | 16·22 | 14·89 | 16·33 | 14·50 | 18·44 | 15·67 | 51·01 | 47·30 | 48·37 | 51·88 | 48·91 | 44·29 | 55·61 | ,, 3–7 |
| ,, 8–12 | 16·11 | 15·39 | 15·61 | 14·61 | 13·67 | 12·72 | 13·56 | 12·11 | 16·39 | 15·11 | 15·11 | 14·06 | 17·17 | 14·72 | 59·83 | 52·31 | 50·99 | 52·53 | 58·51 | 49·54 | 62·12 | ,, 8–12 |
| ,, 13–17 | 14·89 | 14·00 | 13·50 | 12·50 | 11·94 | (10·94) | 12·67 | 10·39 | 16·39 | 15·06 | 13·94 | 12·39 | 16·61 | 14·44 | 63·56 | 55·33 | 52·89 | 53·73 | 58·86 | 50·64 | 61·45 | ,, 13–17 |
| ,, 18–22 | 11·22 | 8·83 | 8·17 | 7·06 | 7·56 | 5·72 | 6·67 | 5·28 | 10·78 | 8·44 | 8·39 | 6·22 | (8·89) | (6·89) | 60·41 | 51·80 | 48·75 | 49·74 | 53·55 | 44·76 | 55·48 | ,, 18–22 |
| ,, 23–27 | 11·67 | 9·67 | 8·50 | 7·33 | (8·06) | (6·39) | 7·61 | 6·56 | 11·67 | 10·28 | 9·00 | 7·56 | 10·56 | 8·72 | 57·24 | 47·96 | (45·42) | 46·11 | 52·36 | 41·41 | 54·14 | ,, 23–27 |
| Oct. 28–2 | 12·61 | 10·89 | 11·06 | 10·00 | 10·17 | 9·06 | 9·94 | 8·50 | 13·22 | 11·78 | 11·22 | 10·06 | 12·72 | 11·06 | 50·86 | 42·86 | 43·90 | 42·73 | 49·18 | 40·14 | 53·43 | Oct. 28–2 |
| ,, 3–7 | 9·83 | 8·22 | 7·11 | 5·83 | 6·22 | 4·72 | 6·89 | 5·06 | 9·78 | 8·33 | 7·50 | 6·17 | 8·56 | 7·33 | 64·10 | 57·95 | 56·73 | 57·85 | 59·22 | 53·75 | 63·79 | ,, 3–7 |
| ,, 8–12 | 9·83 | 7·89 | 6·39 | 5·72 | 7·17 | 5·44 | 7·44 | 6·11 | 9·56 | 7·94 | 7·39 | 5·94 | 7·78 | 6·72 | 56·91 | 47·76 | 45·40 | 46·08 | 50·99 | 40·95 | 53·13 | ,, 8 12 |
| ,, 13–17 | 9·00 | 7·44 | 6·28 | 5·56 | 6·28 | 5·11 | 6·56 | 5·72 | 8·22 | 6·89 | 6·22 | 5·11 | 6·44 | 5·67 | 56·58 | 51·09 | 51·40 | 54·72 | 48·27 | 45·48 | 53·80 | ,, 13–17 |
| ,, 18–22 | 9·17 | 7·39 | 7·33 | 6·50 | 8·39 | 7·06 | 8·72 | 7·89 | 9·78 | 8·56 | 8·00 | 7·28 | 9·06 | 8·56 | 53·35 | 47·00 | 46·44 | 49·26 | 45·93 | 42·02 | 51·26 | ,, 18–22 |
| ,, 23–27 | 9·06 | 8·06 | 7·83 | 7·06 | 8·83 | 7·67 | 9·22 | 8·50 | 10·33 | 9·17 | 8·17 | 7·11 | 9·06 | 8·11 | 41·29 | 38·39 | 40·22 | 44·76 | 40·17 | 36·38 | 47·48 | ,, 23–27 |
| Nov. 28–1 | 10·28 | 9·00 | 8·06 | 7·00 | 8·06 | 6·83 | 8·11 | 6·11 | 11·28 | 10·39 | 8·67 | 7·50 | 10·50 | 9·56 | 50·76 | 41·90 | 39·78 | 40·40 | 50·53 | 40·43 | 54·45 | Nov. 28–1 |
| ,, 2–6 | 11·22 | 9·83 | 9·56 | 8·56 | 8·56 | 7·39 | 8·39 | 6·94 | 11·28 | 10·28 | 9·22 | 8·11 | 10·67 | 9·39 | 54·92 | 46·08 | 44·46 | 45·35 | 54·47 | 43·88 | 57·44 | ,, 2–6 |
| ,, 7–11 | 8·61 | 7·44 | 5·44 | 4·39 | 5·39 | 3·83 | 4·94 | 3·44 | 8·44 | 7·28 | 6·00 | 4·50 | 6·94 | 5·67 | 68·49 | 59·75 | 56·91 | 57·44 | 60·82 | 52·97 | 62·59 | ,, 7–11 |
| ,, 12–16 | 4·50 | 2·72 | 2·67 | 1·67 | 3·39 | 1·83 | 4·61 | 3·06 | 5·39 | 3·72 | 3·28 | 2·06 | 3·61 | 2·56 | 65·18 | 59·73 | 60·10 | 64·12 | 54·87 | 51·40 | 56·45 | ,, 12–16 |
| ,, 17–21 | 8·44 | 6·72 | 4·83 | 4·06 | 4·33 | 3·50 | 6·00 | 4·89 | 8·50 | 7·33 | 4·39 | 3·61 | 6·17 | 5·50 | 44·13 | 38·92 | 40·17 | 43·93 | 43·78 | 37·43 | 49·52 | ,, 17–21 |
| ,, 22–26 | 9·22 | 7·83 | 6·89 | 6·06 | 7·17 | 6·11 | 7·67 | 6·67 | 10·17 | 8·94 | 7·89 | 6·67 | 10·17 | 8·61 | 34·05 | 29·35 | 30·11 | 33·13 | 38·01 | 29·76 | 45·66 | ,, 22–26 |
| Dec. 27–1 | 7·78 | 6·72 | 5·72 | 5·06 | 3·78 | 3·11 | 5·11 | 4·39 | 9·11 | 7·94 | 6·22 | 5·39 | 7·89 | 7·11 | 37·86 | 35·90 | 38·24 | 42·17 | 37·96 | 34·15 | 45·63 | Dec. 27–1 |
| ,, 2–6 | 7·78 | 6·22 | 3·89 | 3·28 | 3·17 | 2·22 | 3·33 | 2·33 | 7·17 | 6·00 | 3·50 | 2·50 | 5·50 | 4·39 | 53·38 | (48·15) | 44·76 | 46·93 | 48·05 | 41·75 | 51·40 | ,, 2–6 |
| ,, 7–11 | 6·11 | 4·28 | 1·72 | 1·17 | 2·50 | 1·33 | 2·22 | 1·06 | 5·89 | 4·61 | 3·00 | 1·94 | 4·33 | 3·17 | 45·93 | 38·41 | 36·97 | 38·59 | 41·31 | 32·32 | 43·98 | ,, 7–11 |
| ,, 12–16 | 7·44 | 6·44 | 2·22 | 1·78 | 1·00 | 0·61 | 1·33 | 0·67 | 8·22 | 7·50 | 1·89 | 1·39 | 4·67 | 4·28 | 52·64 | 48·07 | 49·26 | 52·79 | 47·89 | 43·95 | 54·14 | ,, 12–16 |
| ,, 17–21 | 8·50 | 7·39 | 4·78 | 4·22 | 3·78 | 3·00 | 4·44 | 3·50 | 8·83 | 7·89 | 4·22 | 3·56 | 5·61 | 5·06 | 46·69 | 45·25 | 48·32 | 54·50 | 46·03 | 42·00 | 51·72 | ,, 17–21 |
| ,, 22–26 | 9·89 | 8·89 | 8·72 | 7·89 | 7·94 | 7·00 | 7·28 | 6·44 | 10·44 | 9·28 | 8·33 | 7·28 | 9·22 | 8·22 | 36·82 | 33·99 | 35·37 | 38·75 | 41·08 | 35·40 | 49·92 | ,, 22–26 |
| ,, 27–31 | 7·83 | 6·61 | 5·67 | 4·83 | 5·39 | 4·61 | 5·44 | 4·56 | 8·28 | 7·17 | 6·89 | 6·17 | 7·94 | 6·94 | 749·44 | 744·91 | 745·45 | 748·67 | 748·42 | 743·19 | 755·79 | ,, 27–31 |

NOTE.—The heights in the headings of the temperature columns are those of the thermometer bulbs above the ground. Those in the headings of the pressure columns are those of the barometer cisterns above mean sea level.

Means which are enclosed in brackets are for four days only, owing to various causes, such as clock stopping, defective photography, &c. &c.

* Mean for three days only, 6th and 7th "Trace indistinct."

# APPENDIX II.

## DISCUSSION of the ANEMOMETRICAL RESULTS furnished by the SELF-RECORDING ANEMOMETER at BERMUDA, during four years, commencing 1st April 1859, and ending 31st March 1863.

### INTRODUCTION.

THE instrument from which the observations have been obtained is an anemometer on Dr. Robinson's principle, with Beckley's additions. It was constructed by Mr. Adie, of London, and closely resembles, as regards its size and general construction, the anemographs erected by the Meteorological Committee at their Observatories, and described, with engravings, in their Annual Report to Parliament for 1867. In fact it was the fellow instrument to that formerly erected at Sandwick Manse, Orkney, of which the description, with the discussion of the results obtained with it, are given in the Quarterly Weather Report for 1871, Appendix II. It was sent to Bermuda by Admiral FitzRoy, in compliance with the request of the Royal Society and of the Committee appointed by the British Association at their meeting in Dublin in 1857.

The instrument was sent out under the charge of T. H. Babington, Esq., then Scientific Assistant in the Meteorological Department, and was erected under his superintendence on Ireland Island, on a building known as "The Commissioner's House," at that time occupied as a barrack by the Royal Engineers.

The roof on which the anemometer was placed was about 110 feet above the mean sea level, and the length of the shaft employed was about 11 feet. In adjustment due allowance was made for the magnetic variation at the place, and the vane was set to *true* bearings.

But on the 2d November 1859, the anemometer was removed from the position it had hitherto occupied, and was transferred from the charge of the Royal Engineers to that of the Naval authorities. The only intimation received at this Office that any change had been made was a letter dated 29th January 1860, from Captain F. Hutton, R.N., the Senior Naval Officer in charge at the time. The following is an extract from it:—

"In consequence of some inconvenience to the R.E. Department, I had the anemometer removed to another locality called Maria Hill, on Ireland Island, about one mile to the westward of the Commissioner's House, and the greatest elevation on the island.*

(Signed) "F. HUTTON,
"Captain in charge."

In reply to Admiral FitzRoy's inquiries, Capt. Hutton stated, in a letter dated 24th March 1860:

"The anemometer answers very well in its new fixture, being the most elevated part of the island, and consequently free from eddies and obstructions, and I am quite satisfied with its adjustments and registrations."

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* Governor Lefroy states the height from the ground to the vane to be 105 feet, and in corroboration of Capt. Hutton's statement, Capt. Aplin, now Senior Naval Officer in charge, says that "the wooden building containing the instruments was constructed "for the purpose on Maria Hill. The summit of the hill is just large enough for the instrument, and the hill sloping abruptly, "the tops of the trees are on a lower lever than the ground level of the instrument, and there not being any hills near, the "anemometer is entirely free from any surrounding influence. From the floor level of the building to the apex of the roof is "12ft. 9in., and the centre of the cups is 2ft. 9in. above this height."

Unfortunately, however, owing to frequent changes of the Dockyard authorities, and a deficiency of assistance at such a distant station, the attention paid to the instrument after the first four years was not as regular as might be desired. The papers were frequently unchanged for several days, and left undated, and the instrument naturally got out of order; so that all the records after the time stated have had to be condemned as utterly useless and impossible to tabulate.

A great improvement has lately taken place, and the anemometer put into thorough repair, thanks to the interest taken in the matter by Capt. E. Aplin, R.N., Senior Officer in charge, and his Excellency Major-General J. H. Lefroy, R.A., F.R.S., C.B., the Governor.

The method of reducing the automatic traces has been precisely the same as in the case of Orkney, and described in the Quarterly Weather Report, above quoted; it will therefore be unnecessary to repeat it here. As before, astronomical time has been used throughout; the correction due to friction has been neglected; the direction has been tabulated to every point of the compass, and the rectangular components for every hour of the four years under consideration have been obtained, to the nearest tenth of a mile, by means of a traverse table.

A considerable alteration has taken place in the manner of grouping the observations into tables from that previously followed, on the one hand owing partly to friendly criticisms with which the Office has been favoured by gentlemen conversant with the subject; and, on the other hand, to the period under discussion being considered insufficient to give good detailed results, such as are contemplated by Dr. Robinson in the treatment of longer series. It also seemed desirable to give, in the first place, the hourly means for each year separately.

The tables, which nearly explain themselves, are,

I. The mean monthly components *for each hour* from April 1859 to March 1863, with the mean for each separate month.

II. The mean monthly components for each hour, being the *combined* means for the four months of the same name, together with the combined mean for the whole month.

III. The same grouped for periods of three hours with the resultant Direction and Velocity, for day and night hours separately.

IV. Separate Monthly and Yearly results of Direction and Velocity, and the same combined for the four years.

The resultants have been *calculated* to the nearest 10″ and to the nearest third place of decimals, from the formulæ

$$\text{Tan D} = \frac{\text{E}}{\text{N}} \text{ and } \text{V} = \frac{\text{N}}{\cos \text{D}}$$

and in obtaining the results the sums (not the means) have been used, for greater accuracy.

V. This table is really a continuation of No. IV., giving for each separate month,—

1°. The number of times the wind reached or exceeded 30 miles in the hour.

2°. The number of hours of calm.

3°. The maximum hourly velocity observed, with the direction and time.

4°. The average hourly velocity independently of direction; and

5°. The number of hours lost.

VI. The Monthly means of the Barometer * and Dry and Wet Bulb Thermometers, from observations taken four times daily from April 1859 to March 1862, to correspond to Table I., so far as the observations allow.

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* The barometrical means have not been reduced to sea level.

VII. Mean Monthly values of Barometer and Thermometer for three years combined, to correspond to Table II.

VIII. Separate Monthly and Yearly Results of Barometer and Thermometer, obtained from the four daily observations, to correspond to Table IV.

It will be seen from the tables that, taking the *mean* of the four years, the S (−N.) and the W (−E.) components hold from January to March, the westerly being in excess of the southerly. But in April the S. component has almost entirely yielded to the N., the westerly component still being much in excess. In May, however, the southerly component is re-established and holds till October, but in September (until which time the S. component had been greatly in excess of the W.) the easterly component takes the place of the westerly, and the excess is on the side of the north. In November and December the N. and W. components prevail, the westerly being in excess of the northerly.

Taking individual years, this distribution is not strictly followed, as a glance at Table IV. will show.

In the Yearly periods the prevalent wind is South-westerly, and the mean resultant Direction is S. 37°, 14′ W., the resultant hourly velocity being 3·5 miles.

The maximum absolute Velocity recorded in an hour was 57 miles on the 31st October 1860, direction E. by N. The greatest *mean* absolute Velocity in any month was 22·62 miles per hour in February 1860, and the least 10·95 in September 1861.

Taking the four years combined, the greatest hourly Velocity was 20·08 miles in November, and the least 12·91 in August. The mean Velocity for the whole period of four years was 16·65 miles per hour. It is noticeable that the month of November, which has the greatest absolute velocity, has also the least resultant velocity. This is of course due to the variability of the direction in this month.

Tables VI. to VIII. have been compiled from information very kindly supplied by Sir Henry James, F.R.S., of the Ordnance Survey Office. Unfortunately more complete observations, of a reliable and sufficiently continuous nature were not obtainable. It has however been considered desirable to print the information, so far as it goes, in conjunction with the anemometrical results.

This calculation, like that for Sandwick Manse, has been carried out by Mr. Jas. S. Harding, jun., with the assistance of some other members of the staff of the Office.

A portion of the data from Bermuda, for the period April 1859–September 1860, was discussed by Mr. G. J. Symons, and published by Admiral FitzRoy in the 8th No. of "Meteorological Papers." As the treatment of the materials was entirely different from that now adopted, not being on the principle of components, no use could be made of this previous publication.

# BERMUDA.—ANEMOMETRY.

## TABLE I.—Mean Monthly Components for each Hour.

From April to December 1859.

| Hours. | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | |
| 0 | 0·91 | −10·41 | −6·18 | 4·47 | −5·73 | 0·14 | −5·34 | −6·93 | −10·87 | −4·11 | −5·98 | −1·04 | −0·98 | 0·82 | 1·72 | 1·87 | 1·07 | 2·68 | 0 |
| 1 | 1·57 | −11·20 | −6·45 | 5·63 | −6·51 | 0·11 | −5·59 | −7·12 | −10·39 | −5·08 | −6·98 | −0·45 | −0·67 | 0·27 | 1·91 | 4·45 | 0·81 | 2·41 | 1 |
| 2 | 1·08 | −12·26 | −5·04 | 5·51 | −6·40 | 0·79 | −5·07 | −9·30 | −9·87 | −4·93 | −5·38 | −0·73 | −0·74 | 0·48 | 1·63 | 4·56 | −0·32 | 1·56 | 2 |
| 3 | 0·57 | −12·48 | −5·46 | 5·00 | −6·50 | −0·06 | −4·87 | −8·49 | −8·72 | −5·75 | −5·00 | −0·11 | −0·69 | 0·24 | 0·38 | 5·24 | 0·62 | 1·35 | 3 |
| 4 | 1·97 | −12·76 | −6·05 | 4·28 | −6·83 | 1·28 | −4·97 | −8·36 | −8·13 | −6·05 | −4·77 | 0·07 | −0·87 | −0·09 | 1·28 | 6·49 | 1·63 | 0·86 | 4 |
| 5 | 1·53 | −12·85 | −6·24 | 4·37 | −6·84 | 1·05 | −5·05 | −8·50 | −7·83 | −5·97 | −4·24 | 0·29 | −0·36 | 0·06 | −0·92 | 5·59 | 1·19 | 0·40 | 5 |
| 6 | 1·67 | −11·97 | −5·38 | 5·23 | −6·72 | 1·49 | −4·02 | −7·71 | −7·05 | −4·67 | −3·70 | 0·40 | 0·99 | 0·69 | 0·84 | 6·45 | 0·17 | 0·46 | 6 |
| 7 | 0·62 | −12·18 | −6·63 | 4·08 | −6·04 | 1·60 | −4·42 | −7·18 | −6·90 | −4·85 | −3·55 | 0·99 | 1·70 | 0·58 | 0·07 | 6·92 | −0·40 | 0·55 | 7 |
| 8 | −0·02 | −11·78 | −6·44 | 4·85 | −6·36 | 1·69 | −4·25 | −7·27 | −7·08 | −4·26 | −4·01 | 2·00 | 1·70 | 1·43 | −0·30 | 7·52 | 0·23 | 0·39 | 8 |
| 9 | 1·05 | −12·31 | −5·34 | 5·66 | −6·14 | 2·00 | −3·46 | −6·27 | −6·96 | −3·42 | −4·03 | 2·22 | 2·73 | 1·90 | −1·33 | 6·85 | −0·32 | 0·36 | 9 |
| 10 | 0·57 | −11·82 | −5·77 | 6·89 | −5·90 | 1·44 | −3·65 | −5·61 | −7·84 | −3·78 | −4·51 | 2·39 | 2·29 | 2·31 | −2·09 | 5·93 | −1·10 | −0·50 | 10 |
| 11 | 0·36 | −12·18 | −7·46 | 7·16 | −5·98 | 1·15 | −4·17 | −5·65 | −8·13 | −4·05 | −4·94 | 2·70 | 2·53 | 3·11 | −3·42 | 4·43 | −0·80 | −0·54 | 11 |
| 12 | −0·26 | −12·46 | −7·24 | 6·50 | −6·36 | 1·32 | −4·57 | −5·37 | −7·71 | −5·27 | −4·38 | 1·13 | 3·45 | 2·72 | −4·25 | 4·01 | −1·86 | −0·83 | 12 |
| 13 | −0·78 | −13·55 | −5·65 | 5·28 | −6·06 | 0·73 | −4·32 | −6·48 | −7·92 | −4·74 | −5·09 | 1·46 | 4·23 | 3·11 | −3·59 | 2·24 | −2·77 | −0·74 | 13 |
| 14 | −0·99 | −13·52 | −5·59 | 5·01 | −6·97 | 0·80 | −4·49 | −6·51 | −7·92 | −5·12 | −5·80 | 1·10 | 3·10 | 2·69 | −2·62 | 3·06 | −2·07 | −0·92 | 14 |
| 15 | 0·98 | −13·28 | −5·76 | 5·35 | −6·18 | 0·20 | −3·63 | −5·90 | −7·87 | −5·87 | −5·22 | −0·14 | 2·89 | 2·41 | −2·41 | 1·96 | −2·48 | 0·29 | 15 |
| 16 | 2·92 | −12·62 | −5·98 | 4·42 | −6·35 | 0·13 | −3·75 | −6·86 | −7·95 | −5·16 | −4·51 | −0·44 | 2·55 | 1·46 | −2·50 | 1·31 | −2·14 | −0·23 | 16 |
| 17 | 2·72 | −11·28 | −4·22 | 5·87 | −6·20 | 0·35 | −3·27 | −6·87 | −8·07 | −5·01 | −4·41 | −0·83 | 1·85 | 2·36 | −2·57 | 1·64 | −0·59 | 0·43 | 17 |
| 18 | 2·94 | −10·75 | −5·44 | 5·99 | −6·15 | 0·37 | −3·79 | −5·98 | −7·42 | −5·02 | −4·49 | 0·06 | 1·20 | 1·00 | −1·30 | 2·03 | −0·91 | 0·22 | 18 |
| 19 | 3·44 | −9·86 | −5·59 | 6·63 | −6·09 | 0·52 | −4·19 | −6·65 | −8·55 | −5·12 | −5·08 | 0·79 | 1·14 | 1·65 | −0·34 | 1·31 | 0·51 | −0·32 | 19 |
| 20 | 2·04 | −9·12 | −6·11 | 5·41 | −6·66 | 0·26 | −4·00 | −6·93 | −6·92 | −5·21 | −4·77 | 0·19 | 0·67 | 0·82 | 0·39 | 2·69 | 1·25 | 0·62 | 20 |
| 21 | 2·30 | −11·41 | −7·17 | 4·03 | −6·64 | 0·21 | −4·62 | −6·25 | −7·16 | −4·74 | −6·14 | 0·67 | −0·42 | 1·17 | 0·57 | 3·65 | 0·36 | 1·97 | 21 |
| 22 | 0·49 | −11·88 | −6·35 | 4·81 | −5·51 | −0·18 | −4·44 | −7·16 | −9·06 | −4·43 | −6·55 | 0·45 | −0·96 | 0·97 | 2·19 | 5·51 | 0·99 | 2·87 | 22 |
| 23 | −0·75 | −10·59 | −6·26 | 4·92 | −6·49 | 0·11 | −4·36 | −8·17 | −10·39 | −4·39 | −5·08 | 1·79 | −2·48 | 0·32 | 1·54 | 3·88 | 1·09 | 2·30 | 23 |
| Mean. | 1·12 | −11·86 | −5·99 | 5·31 | −6·32 | 0·73 | −4·35 | −6·98 | −8·20 | −4·88 | −4·94 | 0·62 | 1·04 | 1·35 | −0·63 | 4·15 | −0·24 | 0·65 | Mean. |

FROM JANUARY to DECEMBER 1860.

| Hours. | January. | | February. | | March. | | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | |
| 0 | — 5·85 | — 2·62 | — 1·45 | — 1·16 | — 2·34 | — 4·01 | — 2·02 | — 4·20 | — 1·60 | — 6·72 | —10·06 | — 7·25 | — 9·45 | — 3·82 | — 5·75 | — 3·12 | — 0·05 | 8·30 | — 0·50 | 6·92 | 0·88 | — 5·85 | 1·30 | — 9·55 | 0 |
| 1 | — 5·46 | — 3·58 | — 1·83 | — 1·99 | — 1·76 | — 3·75 | — 2·47 | — 4·92 | — 1·74 | — 7·07 | —10·41 | — 7·57 | — 9·15 | — 3·67 | — 5·58 | — 3·55 | 0·18 | 9·11 | — 1·20 | 8·01 | 0·56 | — 8·19 | 1·57 | — 9·07 | 1 |
| 2 | — 5·71 | — 3·12 | — 1·88 | — 2·50 | — 1·89 | — 4·33 | — 2·27 | — 4·69 | — 2·44 | — 6·86 | —10·44 | — 8·53 | — 9·79 | — 4·30 | — 5·65 | — 3·26 | 0·02 | 8·90 | — 1·05 | 8·08 | 1·52 | — 7·44 | 1·26 | — 9·25 | 2 |
| 3 | — 5·96 | — 2·01 | — 1·44 | — 2·71 | — 2·03 | — 4·26 | — 2·06 | — 4·82 | — 2·11 | — 7·01 | —10·02 | — 8·47 | — 9·28 | — 4·26 | — 6·33 | — 2·98 | 0·37 | 8·08 | — 1·24 | 8·07 | 1·12 | — 8·04 | 2·28 | — 9·63 | 3 |
| 4 | — 5·24 | — 2·16 | — 0·89 | — 2·78 | — 1·07 | — 3·89 | — 2·38 | — 4·34 | — 1·69 | — 7·38 | — 9·91 | — 7·10 | — 9·22 | — 3·64 | — 6·06 | — 2·68 | 0·83 | 7·35 | — 1·43 | 8·55 | 2·19 | — 7·35 | 2·61 | — 8·86 | 4 |
| 5 | — 4·95 | — 1·59 | — 1·68 | — 2·63 | — 1·44 | — 3·38 | — 2·05 | — 4·10 | — 0·33 | — 7·97 | —10·69 | — 6·14 | — 8·67 | — 2·71 | — 5·12 | — 1·75 | 0·99 | 7·87 | — 1·47 | 9·14 | 1·76 | — 6·56 | 2·97 | — 9·95 | 5 |
| 6 | — 5·01 | — 1·55 | — 0·75 | — 2·53 | — 1·68 | — 3·10 | — 2·28 | — 4·10 | — 1·08 | — 7·17 | —10·03 | — 6·54 | — 8·83 | — 2·84 | — 4·93 | — 1·35 | 1·97 | 8·14 | — 0·48 | 9·47 | 1·61 | — 6·73 | 2·35 | — 8·12 | 6 |
| 7 | — 5·24 | — 0·53 | — 1·06 | — 2·49 | — 1·97 | — 3·54 | — 2·23 | — 3·87 | — 0·98 | — 7·38 | — 9·83 | — 6·12 | — 8·43 | — 1·59 | — 5·35 | — 2·00 | 2·16 | 8·13 | — 0·38 | 10·45 | 2·74 | — 6·34 | 2·40 | — 9·14 | 7 |
| 8 | — 5·40 | — 0·72 | — 1·16 | — 3·01 | — 2·32 | — 3·08 | — 2·34 | — 4·75 | — 0·45 | — 7·11 | — 9·23 | — 5·85 | — 8·82 | — 0·93 | — 5·43 | — 1·61 | 1·65 | 8·71 | — 1·11 | 11·26 | 2·74 | — 6·34 | 1·39 | —10·37 | 8 |
| 9 | — 6·19 | — 0·62 | — 2·36 | — 1·89 | — 2·39 | — 3·57 | — 2·32 | — 4·16 | — 0·54 | — 7·91 | — 9·33 | — 5·64 | — 8·38 | — 1·20 | — 5·54 | — 1·56 | 2·18 | 8·91 | — 1·97 | 10·64 | 1·66 | — 6·32 | 1·51 | — 9·76 | 9 |
| 10 | — 5·74 | — 0·90 | — 2·35 | — 1·38 | — 3·48 | — 4·83 | — 2·25 | — 3·06 | — 1·76 | — 6·14 | — 9·04 | — 6·09 | — 8·67 | — 1·22 | — 5·46 | — 2·12 | 1·72 | 9·49 | — 2·03 | 10·67 | 1·87 | — 6·99 | 0·99 | — 9·72 | 10 |
| 11 | — 6·36 | — 1·27 | — 2·35 | — 1·60 | — 3·33 | — 5·07 | — 2·89 | — 3·29 | — 2·05 | — 5·75 | — 8·53 | — 6·54 | — 8·42 | — 0·87 | — 5·98 | — 2·20 | 1·97 | 8·96 | — 2·23 | 10·05 | — 0·90 | — 6·38 | 0·16 | —10·89 | 11 |
| 12 | — 6·73 | — 1·51 | — 2·18 | — 2·61 | — 4·00 | — 6·50 | — 3·73 | — 3·48 | — 2·52 | — 5·66 | — 8·52 | — 5·78 | — 8·78 | — 1·46 | — 6·32 | — 2·58 | 3·07 | 8·68 | — 2·82 | 8·77 | 0·54 | — 8·16 | 0·61 | — 8·76 | 12 |
| 13 | — 7·03 | — 2·06 | — 3·57 | — 4·08 | — 3·63 | — 6·32 | — 3·71 | — 4·58 | — 1·57 | — 5·77 | — 8·97 | — 5·94 | — 9·61 | — 1·38 | — 5·82 | — 1·74 | 1·87 | 8·58 | — 3·05 | 8·97 | — 0·01 | — 7·98 | 0·19 | — 8·90 | 13 |
| 14 | — 6·90 | — 2·76 | — 2·57 | — 4·51 | — 1·75 | — 6·33 | — 3·53 | — 5·11 | — 1·17 | — 4·65 | — 8·72 | — 6·33 | — 9·49 | — 1·75 | — 5·45 | — 1·94 | 1·56 | 8·49 | — 3·00 | 9·07 | — 0·47 | — 8·34 | 1·28 | — 8·42 | 14 |
| 15 | — 6·18 | — 2·87 | — 1·80 | — 4·13 | — 0·35 | — 6·82 | — 2·86 | — 5·19 | — 0·23 | — 4·78 | — 9·55 | — 6·56 | — 9·91 | — 2·16 | — 4·76 | — 0·93 | 1·37 | 7·40 | — 2·31 | 8·13 | 0·29 | — 9·18 | 2·03 | — 8·44 | 15 |
| 16 | — 4·55 | — 2·30 | — 2·18 | — 4·33 | — 0·38 | — 7·40 | — 1·78 | — 5·54 | — 0·03 | — 5·67 | — 9·32 | — 7·54 | — 9·06 | — 2·61 | — 4·34 | — 0·77 | 2·78 | 8·19 | — 1·72 | 8·09 | 0·93 | — 7·04 | 1·33 | — 8·84 | 16 |
| 17 | — 4·65 | — 2·64 | — 0·58 | — 5·50 | — 0·47 | — 7·06 | — 0·72 | — 4·29 | — 0·18 | — 5·98 | — 8·91 | — 7·14 | — 8·37 | — 2·29 | — 3·56 | — 0·49 | 2·81 | 8·18 | — 1·76 | 8·21 | 1·73 | — 7·67 | 1·92 | — 9·58 | 17 |
| 18 | — 4·20 | — 2·69 | — 0·78 | — 4·73 | — 0·47 | — 6·03 | — 0·45 | — 4·38 | — 1·17 | — 5·48 | — 8·86 | — 7·95 | — 8·28 | — 2·39 | — 3·82 | — 1·34 | 2·77 | 9·22 | — 1·95 | 8·21 | 2·40 | — 8·21 | 1·88 | — 8·80 | 18 |
| 19 | — 3·99 | — 2·72 | — 1·54 | — 4·26 | — 0·39 | — 5·67 | — 0·25 | — 4·07 | — 0·70 | — 7·10 | — 9·29 | — 7·20 | — 8·40 | — 2·47 | — 3·86 | — 2·28 | 1·97 | 9·10 | — 2·15 | 8·91 | 2·95 | — 7·62 | 1·49 | — 9·07 | 19 |
| 20 | — 4·31 | — 1·28 | — 1·63 | — 2·95 | — 0·02 | — 5·07 | — 1·28 | — 4·27 | — 0·64 | — 6·32 | — 9·47 | — 7·20 | — 8·95 | — 2·09 | — 5·16 | — 3·12 | 1·44 | 10·11 | — 2·40 | 8·87 | 1·12 | — 6·98 | 1·93 | — 8·33 | 20 |
| 21 | — 5·18 | — 2·45 | — 1·37 | — 1·70 | — 0·38 | — 4·91 | — 0·93 | — 4·19 | — 0·50 | — 6·86 | — 9·66 | — 7·47 | — 9·63 | — 1·47 | — 5·55 | — 3·34 | 0·76 | 10·41 | — 1·05 | 8·43 | 0·64 | — 6·25 | 1·80 | — 7·81 | 21 |
| 22 | — 4·99 | — 1·27 | — 0·61 | — 0·64 | — 1·71 | — 4·26 | — 1·38 | — 3·94 | — 0·37 | — 7·00 | —10·82 | — 8·39 | — 9·54 | — 1·80 | — 5·52 | — 2·71 | 0·86 | 11·62 | — 1·02 | 9·31 | 1·58 | — 5·78 | 1·33 | — 8·53 | 22 |
| 23 | — 5·70 | — 1·97 | — 1·13 | — 1·17 | — 1·78 | — 4·15 | — 2·19 | — 3·62 | — 1·00 | — 7·26 | —10·49 | — 7·92 | — 9·69 | — 2·24 | — 5·85 | — 2·73 | 0·92 | 11·62 | — 1·06 | 8·51 | 0·78 | — 7·41 | 1·65 | — 9·64 | 23 |
| Mean | — 5·48 | — 1·92 | — 1·19 | — 2·85 | — 1·57 | — 4·88 | — 2·10 | — 4·29 | — 0·88 | — 6·45 | — 9·59 | — 6·97 | — 9·03 | — 2·30 | — 5·30 | — 2·16 | 1·51 | 8·90 | — 1·64 | 8·95 | 1·06 | — 7·21 | 1·60 | — 9·14 | Mean. |

## From JANUARY to DECEMBER 1861.

| Hours. | January. | | February. | | March. | | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | E. | N. | N. | E. | |
| 0 | − 0·46 | − 7·31 | − 4·56 | 1·69 | − 0·79 | − 2·61 | − 0·42 | − 6·48 | − 5·90 | − 2·28 | − 6·53 | − 1·16 | −10·75 | 0·04 | − 5·53 | − 3·73 | − 5·32 | 1·54 | − 2·95 | 3·45 | − 0·20 | −15·12 | 7·41 | − 2·19 | 0 |
| 1 | − 0·72 | − 6·76 | − 5·88 | 1·82 | − 1·15 | − 2·49 | − 0·81 | − 6·29 | − 6·57 | − 3·53 | − 7·43 | − 0·39 | −10·97 | 0·42 | − 4·32 | − 3·95 | − 5·23 | 1·22 | − 2·92 | 3·80 | − 0·02 | −15·31 | 6·45 | − 3·42 | 1 |
| 2 | 0·18 | − 6·81 | − 4·75 | 1·71 | − 1·65 | − 2·19 | − 1·03 | − 6·42 | − 7·23 | − 4·16 | − 7·97 | − 0·30 | −10·19 | − 0·20 | − 4·25 | − 4·71 | − 4·62 | 0·10 | − 3·18 | 4·08 | 1·24 | −15·11 | 6·51 | − 3·67 | 2 |
| 3 | 0·07 | − 7·23 | − 4·73 | 1·40 | − 1·83 | − 1·61 | 0·06 | − 5·16 | − 7·09 | − 4·13 | − 8·34 | 1·09 | − 9·74 | − 0·22 | − 3·71 | − 4·37 | − 4·37 | 0·23 | − 3·04 | 4·80 | 1·42 | −15·45 | 6·63 | − 3·04 | 3 |
| 4 | − 0·69 | − 6·86 | − 4·59 | 0·63 | − 2·18 | − 1·77 | 0·63 | − 5·18 | − 6·80 | − 3·59 | − 7·60 | − 0·69 | − 9·05 | − 0·25 | − 3·37 | − 4·15 | − 3·98 | 0·97 | − 2·14 | 3·85 | 1·00 | −15·12 | 7·32 | − 3·12 | 4 |
| 5 | − 0·35 | − 7·12 | − 3·91 | 0·70 | − 3·22 | − 1·59 | 0·53 | − 5·81 | − 6·81 | − 1·97 | − 7·92 | − 0·99 | − 8·81 | − 0·35 | − 2·75 | − 3·72 | − 3·51 | 1·59 | − 1·81 | 4·70 | 1·30 | −14·69 | 7·55 | − 2·37 | 5 |
| 6 | − 0·33 | − 6·50 | − 3·91 | 1·68 | − 3·27 | − 1·98 | 1·04 | − 4·41 | − 4·93 | − 1·83 | − 7·98 | − 0·18 | − 7·99 | 0·30 | − 2·61 | − 3·62 | − 3·95 | 2·10 | − 1·74 | 5·64 | 1·35 | −14·51 | 7·14 | − 2·38 | 6 |
| 7 | − 0·14 | − 6·35 | − 4·04 | 2·03 | − 3·88 | − 2·29 | 1·59 | − 3·41 | − 5·30 | − 0·96 | − 8·44 | 0·05 | − 7·88 | 0·55 | − 2·60 | − 3·23 | − 4·22 | 2·54 | − 2·25 | 6·07 | 1·19 | −14·36 | 7·98 | − 2·18 | 7 |
| 8 | − 0·60 | − 6·51 | − 2·97 | 2·06 | − 3·85 | − 1·75 | 1·48 | − 4·37 | − 5·20 | − 0·93 | − 7·78 | 0·06 | − 7·72 | 0·55 | − 2·50 | − 2·50 | − 4·17 | 2·95 | − 3·11 | 5·95 | 0·69 | −14·34 | 8·25 | − 2·11 | 8 |
| 9 | − 0·77 | − 6·23 | − 3·39 | 1·96 | − 4·35 | − 1·54 | 1·04 | − 4·12 | − 6·55 | − 0·72 | − 7·97 | 0·28 | − 8·19 | 0·80 | − 2·69 | − 2·14 | − 4·88 | 3·46 | − 2·32 | 5·42 | 1·17 | −14·44 | 6·98 | − 1·28 | 9 |
| 10 | − 1·42 | − 6·03 | − 4·59 | 1·82 | − 4·77 | − 1·64 | 0·37 | − 4·20 | − 6·91 | − 0·74 | − 8·66 | − 0·34 | − 8·97 | 1·63 | − 2·65 | − 1·43 | − 4·58 | 2·85 | − 3·13 | 5·20 | 1·34 | −14·35 | 6·46 | − 1·94 | 10 |
| 11 | − 0·92 | − 6·03 | − 4·25 | 1·87 | − 3·89 | − 1·87 | 0·15 | − 4·21 | − 7·15 | − 0·21 | − 8·67 | − 0·90 | − 9·30 | 1·76 | − 3·32 | − 2·04 | − 5·00 | 2·08 | − 3·61 | 4·70 | 1·58 | −13·24 | 6·40 | − 2·61 | 11 |
| 12 | − 2·21 | − 7·12 | − 5·28 | 1·19 | − 3·40 | − 2·38 | 0·60 | − 4·11 | − 7·45 | − 1·12 | − 8·32 | − 2·04 | − 9·09 | 1·62 | − 3·56 | − 2·38 | − 5·21 | 1·57 | − 3·54 | 5·30 | 1·03 | −14·04 | 6·19 | − 2·59 | 12 |
| 13 | − 1·27 | − 7·41 | − 5·88 | 0·91 | − 3·66 | − 4·06 | − 0·80 | − 4·30 | − 7·09 | − 0·85 | − 7·73 | − 2·25 | − 9·95 | 1·57 | − 3·52 | − 2·81 | − 5·64 | 1·60 | − 3·61 | 4·20 | − 0·68 | −14·82 | 6·20 | − 2·28 | 13 |
| 14 | − 0·59 | − 8·06 | − 5·51 | − 1·09 | − 3·51 | − 4·35 | − 0·52 | − 5·70 | − 6·56 | − 2·12 | − 7·35 | − 2·70 | − 9·61 | 0·98 | − 3·53 | − 3·48 | − 5·21 | 1·31 | − 3·28 | 4·10 | − 0·68 | −15·08 | 5·32 | − 2·50 | 14 |
| 15 | − 0·29 | − 8·45 | − 4·96 | − 0·97 | − 3·21 | − 4·54 | − 0·31 | − 5·75 | − 6·39 | − 2·88 | − 6·81 | − 3·14 | − 9·85 | 1·03 | − 3·33 | − 3·66 | − 4·80 | 1·06 | − 2·85 | 4·93 | − 1·38 | −15·87 | 6·30 | − 3·20 | 15 |
| 16 | − 0·17 | − 9·05 | − 4·13 | − 0·86 | − 1·37 | − 5·08 | − 0·51 | − 5·26 | − 6·25 | − 3·53 | − 6·59 | − 2·95 | − 9·35 | 0·45 | − 2·97 | − 4·01 | − 4·08 | 0·70 | − 3·11 | 4·89 | 0·43 | −15·81 | 6·46 | − 2·80 | 16 |
| 17 | 0·89 | − 8·36 | − 4·21 | − 0·19 | − 0·40 | − 5·26 | − 0·58 | − 5·41 | − 6·65 | − 3·33 | − 6·05 | − 2·62 | − 9·05 | 0·78 | − 2·88 | − 3·89 | − 3·89 | 0·50 | − 2·10 | 4·88 | 1·07 | −15·15 | 6·63 | − 4·46 | 17 |
| 18 | 0·97 | − 7·67 | − 3·82 | − 0·38 | 1·34 | − 4·60 | 0·35 | − 7·23 | − 5·93 | − 3·30 | − 5·28 | − 2·32 | − 9·08 | 0·50 | − 2·20 | − 3·36 | − 3·78 | 1·20 | − 1·97 | 5·15 | 1·81 | −14·16 | 8·74 | − 3·90 | 18 |
| 19 | 0·92 | − 6·37 | − 4·20 | 0·89 | 0·04 | − 4·44 | 0·51 | − 5·86 | − 5·39 | − 3·48 | − 5·29 | − 1·63 | − 9·45 | 0·95 | − 2·55 | − 4·86 | − 3·77 | 1·83 | − 1·97 | 5·38 | 1·57 | −14·32 | 7·21 | − 2·10 | 19 |
| 20 | 1·06 | − 5·33 | − 4·35 | 0·93 | − 0·03 | − 3·86 | 0·14 | − 5·98 | − 4·94 | − 3·53 | − 6·39 | − 0·37 | − 9·73 | 0·52 | − 2·74 | − 4·10 | − 3·10 | 0·62 | − 1·48 | 3·82 | 2·23 | −15·20 | 7·94 | − 3·14 | 20 |
| 21 | 1·08 | − 5·46 | − 5·39 | 1·88 | − 0·44 | − 3·36 | − 0·24 | − 5·15 | − 5·08 | − 3·50 | − 5·60 | − 0·32 | − 9·99 | 0·55 | − 3·06 | − 4·20 | − 4·38 | 1·40 | − 1·89 | 4·03 | 1·02 | −13·32 | 7·95 | − 3·14 | 21 |
| 22 | 0·41 | − 5·45 | − 5·06 | 2·94 | − 1·26 | − 3·44 | 0·03 | − 5·49 | − 5·68 | − 4·54 | − 6·13 | − 0·84 | − 9·83 | 1·20 | − 4·00 | − 3·60 | − 4·93 | 2·12 | − 2·35 | 4·14 | − 0·02 | −13·85 | 7·75 | − 2·85 | 22 |
| 23 | 1·22 | − 7·24 | − 4·26 | 1·70 | − 0·58 | − 2·07 | − 1·21 | − 6·97 | − 5·23 | − 3·75 | − 7·05 | − 1·12 | −10·78 | 0·65 | − 4·26 | − 4·33 | − 5·40 | 1·21 | − 3·28 | 4·24 | 0·07 | −14·10 | 6·43 | − 4·86 | 23 |
| Mean | − 0·17 | − 6·90 | − 4·44 | − 1·10 | − 2·14 | − 2·95 | 0·09 | − 5·30 | − 6·21 | − 2·54 | − 7·25 | −1·07 | − 9·39 | 0·66 | − 3·29 | − 3·51 | − 4·50 | 1·53 | − 2·65 | 4·70 | 0·77 | −14·57 | 7·01 | − 2·84 | Mean. |

## From JANUARY to DECEMBER 1862.

| Hours. | January. | | February. | | March. | | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | |
| 0 | − 3·46 | −10·37 | − 4·23 | −11·90 | − 3·56 | −11·28 | 5·26 | − 1·57 | − 7·05 | 1·89 | − 9·53 | − 2·46 | −11·19 | − 4·82 | − 5·56 | − 0·63 | − 0·55 | 5·38 | − 3·49 | 7·03 | 2·88 | 7·62 | 0·21 | − 2·73 | 0 |
| 1 | − 3·05 | −10·61 | − 4·15 | −13·85 | − 3·04 | −12·09 | 5·38 | − 1·10 | − 6·58 | 1·75 | − 9·17 | − 2·09 | −10·27 | − 6·29 | − 5·09 | − 1·08 | − 0·23 | 5·38 | − 2·12 | 7·19 | 3·05 | 7·42 | 2·51 | − 3·26 | 1 |
| 2 | − 2·88 | −10·23 | − 4·43 | −12·12 | − 3·73 | −12·67 | 4·67 | − 2·28 | − 6·41 | 1·29 | − 8·71 | − 2·20 | − 9·70 | − 5·73 | − 4·58 | − 1·15 | − 0·65 | 5·03 | − 2·02 | 7·99 | 3·41 | 8·16 | 1·75 | − 2·49 | 2 |
| 3 | − 2·62 | − 9·87 | − 4·12 | −11·49 | − 3·53 | −12·35 | 4·99 | − 2·76 | − 6·34 | 1·50 | − 8·46 | − 1·56 | − 8·99 | − 6·87 | − 3·51 | − 1·11 | − 0·45 | 5·28 | − 2·59 | 7·60 | 3·56 | 8·84 | 1·99 | − 1·94 | 3 |
| 4 | − 2·44 | − 8·78 | − 4·52 | −12·06 | − 1·90 | −12·35 | 5·04 | − 2·35 | − 6·22 | 1·07 | − 8·55 | − 1·94 | − 9·16 | − 6·39 | − 2·99 | − 1·03 | 0·14 | 5·38 | − 2·80 | 7·87 | 4·42 | 7·74 | 2·05 | − 2·30 | 4 |
| 5 | − 2·42 | − 9·33 | − 3·58 | −11·51 | − 2·29 | −11·85 | 5·91 | − 2·48 | − 5·46 | 1·31 | − 8·09 | − 1·83 | − 8·73 | − 6·02 | − 2·59 | − 1·41 | 0·11 | 5·46 | − 2·54 | 8·67 | 3·58 | 7·31 | 2·01 | − 2·56 | 5 |
| 6 | − 1·38 | − 8·82 | − 3·66 | −11·17 | − 1·96 | −11·02 | 6·16 | − 2·74 | − 5·29 | 1·76 | − 7·48 | − 1·48 | − 8·91 | − 6·03 | − 2·48 | − 1·18 | − 0·38 | 5·43 | − 2·72 | 8·63 | 3·58 | 7·56 | 1·98 | − 1·82 | 6 |
| 7 | − 2·20 | − 8·57 | − 3·98 | −11·58 | − 2·65 | −10·98 | 5·71 | − 2·70 | − 5·32 | 1·99 | − 7·71 | − 1·28 | − 8·70 | − 5·66 | − 2·41 | − 0·53 | − 0·23 | 5·18 | − 2·01 | 8·92 | 2·71 | 6·40 | 1·41 | − 1·66 | 7 |
| 8 | − 2·33 | − 8·97 | − 2·34 | −11·04 | − 2·82 | −11·30 | 5·38 | − 2·97 | − 5·33 | 2·57 | − 8·54 | − 0·53 | − 8·86 | − 4·98 | − 2·67 | − 0·65 | − 0·49 | 4·96 | − 3·38 | 9·10 | 3·23 | 7·17 | 1·36 | − 2·12 | 8 |
| 9 | − 3·44 | − 9·78 | − 2·82 | −11·45 | − 2·45 | −11·51 | 4·37 | − 3·00 | − 5·85 | 2·45 | − 9·28 | − 0·33 | − 9·02 | − 4·81 | − 3·24 | − 0·12 | 0·27 | 5·74 | − 4·09 | 8·50 | 4·08 | 8·08 | 0·87 | − 2·91 | 9 |
| 10 | − 3·58 | −10·38 | − 3·79 | −11·10 | − 3·20 | −12·10 | 4·04 | − 3·31 | − 6·01 | 2·60 | −10·08 | − 0·29 | − 9·13 | − 3·87 | − 3·02 | 0·28 | − 0·42 | 5·94 | − 4·36 | 8·64 | 2·16 | 7·85 | 0·92 | − 3·17 | 10 |
| 11 | − 3·38 | −10·29 | − 3·10 | −11·48 | − 3·89 | −11·83 | 3·90 | − 3·27 | − 6·65 | 2·24 | −10·64 | − 0·52 | − 8·53 | − 4·02 | − 3·62 | − 0·01 | − 0·85 | 5·39 | − 5·09 | 8·87 | 3·30 | 8·16 | 1·93 | − 4·00 | 11 |
| 12 | − 3·90 | −10·37 | − 3·06 | −12·15 | − 4·76 | −12·40 | 3·92 | − 2·80 | − 6·92 | 1·97 | −10·60 | − 0·55 | − 8·96 | − 4·28 | − 3·17 | 0·14 | − 1·19 | 5·39 | − 5·16 | 8·23 | 1·91 | 7·24 | 2·75 | − 3·68 | 12 |
| 13 | − 4·23 | −10·50 | − 3·49 | −12·52 | − 4·39 | −12·70 | 3·93 | − 2·60 | − 6·84 | 1·36 | −10·98 | − 1·05 | − 9·17 | − 4·49 | − 3·72 | − 0·07 | − 1·32 | 4·16 | − 4·65 | 8·04 | 1·65 | 7·25 | 2·56 | − 4·01 | 13 |
| 14 | − 4·23 | −10·20 | − 3·65 | −13·34 | − 3·67 | −13·16 | 4·02 | − 2·68 | − 6·63 | 1·71 | −10·75 | − 1·57 | − 9·19 | − 4·36 | − 4·22 | − 0·87 | − 1·03 | 3·52 | − 5·51 | 7·65 | 1·51 | 7·13 | 0·97 | − 3·87 | 14 |
| 15 | − 3·76 | −10·50 | − 0·90 | −13·40 | − 2·81 | −13·85 | 3·63 | − 2·57 | − 6·28 | 0·85 | −10·53 | − 2·21 | − 8·84 | − 4·43 | − 3·63 | − 0·86 | − 1·06 | 4·04 | − 4·91 | 7·04 | 1·73 | 7·23 | 0·93 | − 3·79 | 15 |
| 16 | − 3·56 | −11·42 | − 0·57 | −13·42 | − 1·44 | −13·36 | 3·77 | − 3·82 | − 5·47 | 0·93 | − 9·96 | − 2·90 | − 8·94 | − 4·35 | − 3·54 | − 0·84 | − 0·11 | 3·59 | − 4·90 | 6·88 | 1·29 | 6·52 | 0·59 | − 4·40 | 16 |
| 17 | − 3·55 | −11·79 | − 0·80 | −14·04 | − 1·92 | −13·66 | 4·82 | − 2·02 | − 5·51 | 1·10 | −10·59 | − 3·13 | − 8·44 | − 3·88 | − 3·40 | − 1·35 | − 0·36 | 4·04 | − 4·80 | 7·39 | 1·95 | 7·35 | 0·58 | − 4·95 | 17 |
| 18 | − 2·08 | −10·44 | − 0·50 | −13·03 | − 1·24 | −12·83 | 5·06 | − 2·19 | − 5·57 | 1·26 | −10·48 | − 2·45 | − 8·56 | − 3·67 | − 3·65 | − 1·49 | 0·23 | 3·86 | − 5·06 | 7·86 | 2·81 | 7·19 | 0·30 | − 4·39 | 18 |
| 19 | − 2·11 | −10·26 | − 1·19 | −12·32 | − 2·73 | −12·10 | 5·16 | − 1·27 | − 5·01 | 1·99 | −10·43 | − 3·00 | − 9·21 | − 4·32 | − 3·57 | − 1·12 | − 0·58 | 4·83 | − 4·20 | 8·38 | 3·35 | 6·96 | 0·03 | − 4·62 | 19 |
| 20 | − 0·91 | −10·50 | − 2·07 | −11·90 | − 2·57 | −12·54 | 5·32 | − 0·37 | − 5·40 | 2·34 | −10·03 | − 2·04 | − 9·11 | − 4·72 | − 3·63 | − 0·96 | − 0·46 | 4·63 | − 4·46 | 9·64 | 3·31 | 6·04 | 0·77 | − 4·83 | 20 |
| 21 | − 1·50 | − 9·97 | − 2·04 | −12·86 | − 2·78 | −13·37 | 4·46 | 0·95 | − 5·61 | 1·53 | −10·16 | − 2·13 | − 9·53 | − 4·03 | − 4·11 | − 1·20 | 0·27 | 3·66 | − 5·02 | 7·89 | 3·97 | 7·09 | 0·44 | − 4·59 | 21 |
| 22 | − 2·56 | − 9·44 | − 4·08 | −13·08 | − 2·14 | −12·57 | 4·09 | 1·66 | − 5·46 | 2·57 | −10·50 | − 2·35 | −10·11 | − 3·44 | − 4·68 | − 1·23 | − 0·32 | 4·76 | − 5·14 | 7·86 | 4·84 | 7·26 | 0·32 | − 3·55 | 22 |
| 23 | − 3·14 | − 9·21 | − 3·55 | −13·82 | − 2·99 | −12·53 | 4·57 | 1·30 | − 6·34 | 2·13 | −11·37 | − 2·92 | −10·46 | − 3·95 | − 5·20 | − 0·95 | − 0·31 | 5·80 | − 4·74 | 8·38 | 4·10 | 7·38 | 0·40 | − 3·28 | 23 |
| Mean | − 2·85 | −10·03 | − 2·90 | −12·32 | − 2·85 | −12·35 | 4·75 | − 1·96 | − 5·98 | 1·79 | − 9·69 | − 1·78 | − 9·24 | − 4·81 | − 3·68 | − 0·81 | − 0·42 | 4·87 | − 3·99 | 8·08 | 3·02 | 7·37 | 1·23 | − 3·37 | Mean. |

From JANUARY to MARCH 1863.

| Hours. | January. | | February. | | March. | | Hours. |
|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | |
| 0 | − 2·14 | − 1·67 | − 3·34 | − 1·70 | − 6·39 | − 2·72 | 0 |
| 1 | − 0·28 | − 1·83 | − 3·35 | − 2·32 | − 7·21 | − 3·49 | 1 |
| 2 | 1·58 | − 3·49 | − 3·20 | − 2·69 | − 6·15 | − 3·72 | 2 |
| 3 | 0·93 | − 2·55 | − 3·79 | − 1·46 | − 5·78 | − 3·16 | 3 |
| 4 | 1·55 | − 2·39 | − 3·63 | − 1·78 | − 5·31 | − 2·71 | 4 |
| 5 | 2·52 | − 1·05 | − 2·69 | − 2·67 | − 5·32 | − 2·47 | 5 |
| 6 | 3·00 | 0·10 | − 1·71 | − 1·43 | − 4·22 | − 1·90 | 6 |
| 7 | 2·49 | 0·28 | − 1·61 | − 2·15 | − 4·24 | − 1·82 | 7 |
| 8 | 1·53 | 0·98 | − 1·36 | − 2·62 | − 4·57 | − 1·65 | 8 |
| 9 | 1·96 | 1·27 | − 1·96 | − 3·11 | − 5·73 | − 0·43 | 9 |
| 10 | 2·33 | − 0·75 | − 2·40 | − 1·82 | − 5·69 | − 0·97 | 10 |
| 11 | 0·62 | − 0·29 | − 2·99 | − 1·64 | − 5·82 | − 1·90 | 11 |
| 12 | 0·93 | 0·12 | − 1·99 | − 2·10 | − 6·89 | − 1·69 | 12 |
| 13 | − 0·64 | − 0·53 | − 2·40 | − 2·22 | − 6·65 | − 1·74 | 13 |
| 14 | 0·15 | − 1·27 | − 2·32 | − 2·26 | − 6·55 | − 2·56 | 14 |
| 15 | 0·23 | − 1·25 | − 2·35 | − 1·84 | − 6·25 | − 3·89 | 15 |
| 16 | − 0·19 | − 1·27 | − 2·86 | − 2·42 | − 6·02 | − 3·57 | 16 |
| 17 | − 0·54 | − 1·58 | − 2·23 | − 2·56 | − 6·20 | − 2·84 | 17 |
| 18 | − 0·84 | − 1·54 | − 1·54 | − 1·83 | − 5·08 | − 2·54 | 18 |
| 19 | − 0·99 | − 1·62 | − 1·61 | − 1·89 | − 4·67 | − 2·64 | 19 |
| 20 | − 0·18 | − 1·40 | − 1·45 | − 2·08 | − 4·25 | − 1·91 | 20 |
| 21 | − 0·11 | − 1·31 | − 2·33 | − 1·93 | − 5·74 | − 1·83 | 21 |
| 22 | − 0·97 | − 1·49 | − 3·64 | − 2·70 | − 5·88 | − 0·43 | 22 |
| 23 | − 1·00 | − 1·87 | − 4·19 | − 2·25 | − 6·03 | − 1·48 | 23 |
| Mean | 0·49 | − 1·10 | − 2·54 | − 2·14 | − 5·69 | − 2·25 | Mean. |

TABLE II.—MEAN MONTHLY COMPONENTS for each HOUR, being the MEAN of FOUR MONTHS of the same Name combined.

| Hours. | January. | | February. | | March. | | April. | | May. | | June. | | July. | | August. | | September. | | October. | | November. | | December. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | |
| 0 | − 2·98 | − 5·49 | − 3·40 | − 3·27 | − 3·27 | − 5·16 | 0·93 | − 5·67 | − 5·18 | − 0·66 | − 7·96 | − 2·68 | − 9·18 | − 3·88 | − 6·93 | − 1·34 | − 2·98 | 3·55 | − 1·98 | 4·56 | 1·32 | − 2·87 | 2·55 | − 2·95 | 0 |
| 1 | − 2·38 | − 5·70 | − 3·30 | − 3·84 | − 3·29 | − 5·46 | 0·92 | − 5·88 | − 5·34 | − 0·81 | − 8·38 | − 2·49 | − 9·00 | − 4·17 | − 6·35 | − 1·64 | − 3·07 | 3·82 | − 1·73 | 4·82 | 1·38 | − 2·91 | 2·84 | − 3·34 | 1 |
| 2 | − 1·71 | − 5·91 | − 3·57 | − 3·90 | − 3·36 | − 5·70 | 0·61 | − 6·41 | − 5·23 | − 1·06 | − 8·38 | − 2·56 | − 8·69 | − 4·88 | − 6·09 | − 1·88 | − 2·66 | 3·33 | − 1·75 | 5·16 | 1·95 | − 2·46 | 2·30 | − 3·46 | 2 |
| 3 | − 1·90 | − 5·42 | − 3·52 | − 3·57 | − 3·29 | − 5·35 | 0·89 | − 6·31 | − 5·25 | − 1·16 | − 8·33 | − 2·25 | − 8·22 | − 4·96 | − 5·57 | − 2·11 | − 2·36 | 3·37 | − 1·89 | 5·18 | 1·62 | − 2·35 | 2·88 | − 3·32 | 3 |
| 4 | − 1·71 | − 5·05 | − 3·41 | − 4·00 | − 2·62 | − 5·18 | 1·32 | − 6·16 | − 5·19 | − 1·41 | − 8·22 | − 2·11 | − 8·10 | − 4·66 | − 5·14 | − 2·14 | − 1·95 | 3·44 | − 1·81 | 5·05 | 2·22 | − 2·06 | 3·40 | − 3·36 | 4 |
| 5 | − 1·30 | − 4·77 | − 2·97 | − 4·03 | − 3·07 | − 4·82 | 1·48 | − 6·31 | − 4·71 | − 1·07 | − 8·39 | − 1·98 | − 7·82 | − 4·40 | − 4·57 | − 2·34 | − 1·66 | 3·80 | − 1·55 | 5·64 | 1·43 | − 2·09 | 3·43 | − 3·62 | 5 |
| 6 | − 0·93 | − 4·19 | − 2·51 | − 3·36 | − 2·78 | − 4·50 | 1·65 | − 5·81 | − 4·17 | − 0·50 | − 8·05 | − 1·68 | − 7·44 | − 4·07 | − 4·27 | − 2·03 | − 1·52 | 4·02 | − 0·99 | 6·11 | 1·85 | − 1·81 | 2·91 | − 2·97 | 6 |
| 7 | − 1·27 | − 3·79 | − 2·67 | − 3·55 | − 3·19 | − 4·66 | 1·42 | − 5·54 | − 4·56 | − 0·57 | − 8·01 | − 1·44 | − 7·36 | − 3·47 | − 4·32 | − 1·65 | − 1·46 | 4·21 | − 0·74 | 6·51 | 1·68 | − 1·85 | 2·85 | − 3·11 | 7 |
| 8 | − 1·70 | − 3·81 | − 1·93 | − 3·65 | − 3·39 | − 4·45 | 1·13 | − 5·97 | − 4·36 | − 0·16 | − 7·98 | − 1·16 | − 7·41 | − 3·16 | − 4·42 | − 1·45 | − 1·76 | 4·66 | − 1·48 | 6·94 | 1·59 | − 1·50 | 2·81 | − 3·55 | 8 |
| 9 | − 2·11 | − 3·84 | − 2·63 | − 3·62 | − 3·73 | − 4·26 | 1·04 | − 5·90 | − 4·57 | 0·37 | − 8·18 | − 0·92 | − 7·26 | − 2·87 | − 4·61 | − 1·03 | − 1·62 | 5·08 | − 1·41 | 6·62 | 1·40 | − 1·46 | 2·26 | − 3·40 | 9 |
| 10 | − 2·10 | − 4·52 | − 3·28 | − 3·12 | − 4·29 | − 4·89 | 0·68 | − 5·60 | − 5·11 | 0·66 | − 8·42 | − 1·32 | − 7·61 | − 2·27 | − 4·74 | − 0·70 | − 1·95 | 5·17 | − 1·81 | 6·71 | 0·82 | 1·89 | 1·82 | − 3·83 | 10 |
| 11 | − 2·51 | − 4·47 | − 3·17 | − 3·46 | − 4·23 | − 5·17 | 0·38 | − 5·74 | − 5·83 | 0·86 | − 8·46 | − 1·70 | − 7·61 | − 2·20 | − 5·26 | − 0·98 | − 2·21 | 4·78 | − 2·10 | 6·68 | 0·14 | − 1·76 | 1·92 | − 4·51 | 11 |
| 12 | − 2·98 | − 4·72 | − 3·13 | − 3·92 | − 4·76 | − 5·74 | 0·13 | − 5·71 | − 6·03 | 0·42 | − 8·45 | − 1·76 | − 7·85 | − 2·37 | − 5·19 | − 1·23 | − 1·93 | 4·19 | − 2·02 | 6·26 | − 0·19 | − 2·74 | 1·92 | − 3·97 | 12 |
| 13 | − 3·29 | − 5·13 | − 3·84 | − 4·48 | − 4·58 | − 6·21 | − 0·34 | − 6·26 | − 5·29 | 0·03 | − 8·44 | − 2·13 | − 8·26 | − 2·70 | − 5·25 | − 1·47 | − 2·55 | 3·95 | − 1·77 | 6·08 | − 0·66 | − 3·33 | 1·55 | − 3·98 | 13 |
| 14 | − 2·97 | − 5·57 | − 3·51 | − 5·30 | − 3·87 | − 6·60 | − 0·26 | − 6·75 | − 4·99 | 0·01 | − 8·45 | − 2·43 | − 8·20 | − 2·91 | − 5·28 | − 1·88 | − 2·62 | 3·61 | − 2·17 | 5·88 | − 0·57 | − 3·31 | 1·38 | − 3·93 | 14 |
| 15 | − 2·50 | − 5·77 | − 2·50 | − 5·09 | − 3·16 | − 7·28 | 0·36 | − 6·70 | − 4·67 | − 0·37 | − 8·27 | − 2·93 | − 8·06 | − 2·87 | − 4·90 | − 2·37 | − 2·43 | 3·09 | − 1·80 | 5·63 | − 0·44 | − 3·97 | 1·70 | − 3·79 | 15 |
| 16 | − 2·12 | − 6·01 | − 2·44 | − 5·26 | − 2·11 | − 7·35 | 1·10 | − 6·81 | − 4·42 | − 0·96 | − 8·06 | − 3·32 | − 7·78 | − 3·34 | − 4·70 | − 2·31 | − 1·48 | 3·01 | − 1·80 | 5·33 | 0·04 | − 3·76 | 1·56 | − 4·07 | 16 |
| 17 | − 1·96 | − 6·09 | − 1·96 | − 5·57 | − 2·01 | − 7·21 | 1·56 | − 5·75 | − 4·05 | − 0·59 | − 7·94 | − 3·14 | − 7·28 | − 3·07 | − 4·48 | − 2·44 | − 1·46 | 2·97 | − 1·70 | 5·71 | 0·55 | − 3·46 | 2·14 | − 4·64 | 17 |
| 18 | − 1·54 | − 5·59 | − 1·27 | − 4·99 | − 1·13 | − 6·50 | 1·98 | − 6·14 | − 3·94 | − 0·38 | − 7·69 | − 3·09 | − 7·43 | − 2·89 | − 4·27 | − 2·13 | − 1·32 | 3·59 | − 1·95 | 5·56 | 1·43 | − 3·29 | 2·50 | − 4·22 | 18 |
| 19 | − 1·54 | − 4·99 | − 1·37 | − 4·40 | − 1·74 | − 6·21 | 2·22 | − 5·27 | − 3·82 | − 0·49 | − 7·78 | − 2·83 | − 7·81 | − 3·12 | − 4·63 | − 2·21 | − 1·87 | 4·14 | − 1·80 | 6·08 | 1·88 | − 3·42 | 2·31 | − 4·03 | 19 |
| 20 | − 1·09 | − 4·63 | − 1·56 | − 4·00 | − 1·72 | − 5·85 | 1·56 | − 4·94 | − 3·97 | − 0·53 | − 8·14 | − 2·34 | − 7·95 | − 3·31 | − 4·61 | − 1·79 | − 1·72 | 3·89 | − 1·92 | 5·79 | 1·76 | − 2·86 | 2·97 | − 3·92 | 20 |
| 21 | − 1·43 | − 4·80 | − 2·25 | − 3·65 | − 2·34 | − 5·87 | 1·40 | − 4·95 | − 4·59 | − 1·20 | − 8·02 | − 2·43 | − 8·44 | − 2·80 | − 4·97 | − 1·70 | − 2·37 | 4·04 | − 2·10 | 5·38 | 1·55 | − 2·21 | 2·64 | − 3·39 | 21 |
| 22 | − 2·03 | − 4·41 | − 3·35 | − 3·37 | − 2·75 | − 5·18 | 0·81 | − 4·91 | − 4·47 | − 1·04 | − 8·24 | − 2·94 | − 8·48 | − 2·80 | − 5·82 | − 1·64 | − 2·74 | 4·74 | − 2·37 | 5·57 | 1·36 | − 1·72 | 2·60 | − 3·02 | 22 |
| 23 | − 2·16 | − 5·07 | − 3·28 | − 3·89 | − 2·85 | − 5·06 | 0·11 | − 4·97 | − 4·71 | − 0·99 | − 8·85 | − 2·96 | − 8·82 | − 3·43 | − 6·43 | − 1·74 | − 2·47 | 5·11 | − 2·89 | 5·36 | 1·23 | − 2·56 | 2·39 | − 3·87 | 23 |
| Mean | − 2·01 | − 4·99 | − 2·78 | − 4·05 | − 3·06 | − 5·61 | 0·96 | − 5·85 | − 4·77 | − 0·48 | − 8·21 | − 2·27 | − 8·00 | − 3·36 | − 5·12 | − 1·76 | − 2·09 | 3·98 | − 1·81 | 5·78 | 1·06 | − 2·57 | 2·40 | − 3·68 | Mean. |

TABLE III.—MEAN MONTHLY COMPONENTS for 3-hourly Periods, with RESULTANT DIRECTION and VELOCITY for Day and Night Hours, for the Four Years commencing April 1859, and ending March 1863.

The Day Hours include 18h to 5h, and the Night Hours 6h to 17h.

| Hours. | January. | | February. | | March. | | April. | | May. | | June. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | |
| 0–2 | −2·35 | −5·70 | −3·42 | −3·67 | −3·31 | −5·44 | 0·82 | −5·99 | −5·25 | −0·84 | −8·24 | −2·58 | 0–2 |
| 3–5 | −1·63 | −5·08 | −3·30 | −3·86 | −2·99 | −5·12 | 1·23 | −6·26 | −5·05 | −1·21 | −8·31 | −2·11 | 3–5 |
| 6–8 | −1·30 | −3·93 | −2·37 | −3·52 | −3·12 | −4·53 | 1·40 | −5·77 | −4·36 | −0·41 | −8·01 | −1·42 | 6–8 |
| 9–11 | −2·24 | −4·28 | −3·03 | −3·40 | −4·08 | −4·77 | 0·70 | −5·74 | −5·17 | 0·63 | −8·35 | −1·32 | 9–11 |
| 12–14 | −3·08 | −5·14 | −3·49 | −4·57 | −4·41 | −6·18 | −0·15 | −6·24 | −5·44 | 0·15 | −8·44 | −2·11 | 12–14 |
| 15–17 | −2·19 | −5·96 | −2·30 | −5·31 | −2·43 | −7·28 | 1·01 | −6·42 | −4·38 | −0·64 | −8·09 | −3·13 | 15–17 |
| 18–20 | −1·39 | −5·07 | −1·40 | −4·46 | −1·53 | −6·19 | 1·92 | −5·45 | −3·91 | −0·47 | −7·87 | −2·75 | 18–20 |
| 21–23 | −1·87 | −4·76 | −2·96 | −3·64 | −2·64 | −5·37 | 0·77 | −4·94 | −4·59 | −1·08 | −8·37 | −2·78 | 21–23 |
| | D. | V. | D. | V. | D. | V. | D. | V. | D. | V. | D. | V. | |
| Day - | ° ′ ″ S. 70 37 30 W. | 5·461 | ° ′ ″ S. 54 40 30 W. | 4·789 | ° ′ ″ S. 64 39 30 W. | 6·115 | ° ′ ″ N. 78 11 20 W. | 5·781 | ° ′ ″ S. 10 49 20 W. | 4·784 | ° ′ ″ S. 17 18 20 W. | 8·612 | Day. |
| Night - | S. 65 27 20 W. | 5·304 | S. 56 19 20 W. | 5·045 | S. 58 21 0 W. | 6·686 | N. 83 2 40 W. | 6·090 | S. 0 48 0 W. | 4·836 | S. 13 37 10 W. | 8·461 | Night. |

| Hours. | July. | | August. | | September. | | October. | | November. | | December. | | Hours. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | N. | E. | |
| 0–2 | −8·96 | −4·31 | −6·45 | −1·62 | −2·90 | 3·56 | −1·82 | 4·84 | 1·55 | −2·75 | 2·56 | −3·25 | 0–2 |
| 3–5 | −8·05 | −4·67 | −5·09 | −2·20 | −1·99 | 3·54 | −1·75 | 5·29 | 1·76 | −2·17 | 3·24 | −3·43 | 3–5 |
| 6–8 | −7·40 | −3·57 | −4·33 | −1·71 | −1·58 | 4·29 | −1·07 | 6·52 | 1·70 | −1·72 | 2·86 | −3·21 | 6–8 |
| 9–11 | −7·49 | −2·44 | −4·87 | −0·90 | −1·92 | 5·01 | −1·77 | 6·67 | 0·79 | −1·70 | 2·00 | −3·91 | 9–11 |
| 12–14 | −8·10 | −2·66 | −5·24 | −1·53 | −2·36 | 3·92 | −1·99 | 6·07 | −0·47 | −3·12 | 1·61 | −3·96 | 12–14 |
| 15–17 | −7·71 | −3·09 | −4·69 | −2·37 | −1·79 | 3·02 | −1·76 | 5·56 | 0·05 | −3·73 | 1·80 | −4·16 | 15–17 |
| 18–20 | −7·73 | −3·10 | −4·51 | −2·04 | −1·64 | 3·87 | −1·89 | 5·81 | 1·69 | −3·19 | 2·60 | −4·06 | 18–20 |
| 21–23 | −8·58 | −3·01 | −5·74 | −1·69 | −2·53 | 4·63 | −2·45 | 5·44 | 1·38 | −2·16 | 2·54 | −3·43 | 21–23 |
| | D. | V. | D. | V. | D. | V. | D. | V. | D. | V. | D. | V. | |
| Day - | ° ′ ″ S. 24 22 50 W. | 9·143 | ° ′ ″ S. 19 6 40 W. | 5·765 | ° ′ ″ S. 59 52 30 E. | 4·508 | ° ′ ″ S. 69 42 40 E. | 5·698 | ° ′ ″ N. 58 8 50 W. | 3·021 | ° ′ ″ N. 52 19 10 W. | 4·473 | Day. |
| Night - | S. 20 57 40 W. | 8·219 | S. 18 47 50 W. | 5·054 | S. 64 46 30 E. | 4·490 | S. 75 7 30 E. | 6·418 | N. 78 38 20 W. | 2·619 | N. 61 31 40 W. | 4·335 | Night. |

## TABLE IV.

### Separate Monthly and Yearly Results of Direction and Velocity.

| Months. | 1859. | | 1860. | | 1861. | | 1862. | | 1863. | | Mean of four similar months. | | Months. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | D. | V. | D. | V. | D. | V. | D. | V. | D. | V. | D. | V. | |
| | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | ° ′ ″ | | |
| January - | — | — | S. 19 21 0 W. | 5·808 | S. 88 34 20 W. | 6·906 | S. 74 3 40 W. | 10·425 | N. 66 12 20 W. | 1·202 | S. 68 4 40 W. | 5·377 | January. |
| February - | — | — | S. 67 20 40 W. | 3·083 | S. 13 52 0 W. | 4·576 | S. 76 28 20 W. | 12·668 | S. 40 11 0 W. | 3·325 | S. 58 49 50 W. | 5·377 | February. |
| March - | — | — | S. 72 12 50 W. | 5·130 | S. 54 3 30 W. | 3·642 | S. 76 59 40 W. | 12·675 | S. 21 35 10 W. | 6·123 | S. 61 21 50 W. | 6·391 | March. |
| April - | N. 84 35 20 W. | 11·908 | S. 63 55 50 W. | 4·776 | N. 89 3 30 W. | 5·299 | N. 22 27 30 W. | 5·120 | — | — | N. 80 40 40 W. | 5·930 | April. |
| May - - | S. 41 31 40 E. | 8·003 | S. 82 12 10 W. | 6·514 | S. 22 14 50 W. | 6·711 | S. 16 21 40 E. | 6·236 | — | — | S. 5 47 0 W. | 4·792 | May. |
| June - - | S. 6 34 10 E. | 6·359 | S. 35 59 50 W. | 11·850 | S. 8 25 50 W. | 7·324 | S. 10 25 40 W. | 9·855 | — | — | S. 15 28 40 W. | 8·519 | June. |
| July - - | S. 58 5 40 W. | 8·222 | S. 14 16 20 W. | 9·322 | S. 4 1 10 E. | 9·411 | S. 27 30 0 W. | 10·415 | — | — | S. 22 45 40 W. | 8·677 | July. |
| August - | S. 30 44 40 W. | 9·537 | S. 22 13 0 E. | 5·725 | S. 46 53 10 W. | 4·810 | S. 12 24 20 W. | 3·766 | — | — | S. 18 57 50 W. | 5·409 | August. |
| September - | S. 7 11 20 E. | 4·981 | N. 80 23 10 E. | 9·024 | S. 18 47 20 E. | 4·754 | S. 85 7 20 E. | 4·886 | — | — | S. 62 19 10 E. | 4·494 | September. |
| October - | N. 52 34 50 E. | 1·704 | S. 79 36 40 E. | 9·099 | S. 60 33 20 E. | 5·393 | S. 63 43 50 E. | 9·015 | — | — | S. 72 34 40 E. | 6·051 | October. |
| November - | S. 81 22 0 E. | 4·197 | N. 81 37 10 W. | 7·293 | N. 86 58 0 W. | 14·590 | N. 67 45 10 E. | 7·966 | — | — | N. 67 38 40 W. | 2·775 | November. |
| December - | S. 69 31 30 E. | 0·696 | N. 80 4 0 W. | 9·282 | N. 22 3 0 W. | 7·561 | N. 69 53 20 W. | 3·591 | — | — | N. 56 51 10 W. | 4·390 | December. |
| Year - - | S. 20 55 10 W.* | 3·391 | S. 38 34 10 W. | 3·476 | S. 46 30 10 W. | 3·895 | S. 37 46 40 W. | 3·447 | S. 35 21 30 W.† | 3·167 | S. 37 14 0 W. | 3·500 | Year. |

* Nine months.

† Three months.

## TABLE V.

GENERAL SUMMARY. See p. [14].

1859.

| Months. | 30 + | 0 | Maximum Velocity observed. | | | | Absolute Hourly Velocity for the Month. | Hours lost. |
|---|---|---|---|---|---|---|---|---|
| | | | Day. | Hour. | D. | V. | | |
| April - - - | 88 | 0 | 1st | 11 | N.W. | 47 | 20·37 | 97 |
| May - - - | 19 | 0 | 6th<br>29th | 10–12<br>4 and 7 | E. by S.<br>S. | 40 | 14·67 | 101 |
| June - - | 0 | 0 | 19th | 20 and 21 | S. by W.<br>S.S.W. | 26 | 12·17 | 112 |
| July - - - | 16 | 40 | 20th | 16 | W. by S. | 33 | 13·71 | 0 |
| August - - - | 10 | 24 | 17th | 1 | S. | 41 | 12·07 | 0 |
| September - - | 49 | 0 | 28th | 4 | S. by W. | 41 | 14·49 | 25 |
| October - - | 55 | 1 | 5th | 7 and 8 | S. | 33 | 17·36 | 112 |
| November - - | 107 | 0 | 8th | 4 | E. | 50 | 19·94 | 51 |
| December - - | 29 | 0 | 13th | 23 | S.E. | 36 | 17·45 | 0 |

1860.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| January - - - | 25 | 2 | 2<br>17<br>27 | 3, 17<br>6<br>23 | S.W. by W.; N.W. by W.<br>S.<br>N.W. by W. | 33 | 15·52 | 44 |
| February - - - | 169 | 0 | 12th | 15 | N.W. by W. | 43 | 22·62 | 0 |
| March - - - | 68 | 0 | 22nd | 3<br>4 | W. by S.<br>W. | 42 | 17·29 | 25 |
| April - - - | 27 | 0 | 28th | 12<br>13<br>15 | S.E. by E.<br>S.E.<br>S.E. | 37 | 16·58 | 0 |
| May - - - | 35 | 0 | 29th | 10<br>11, 16, and 17 | W. by S.<br>W. | 36 | 14·60 | 50 |
| June - - - | 9 | 0 | 8th | 22 | S.S.W. | 34 | 16·06 | 11 |
| July - - - | 0 | 0 | 1st<br>2nd | 19<br>2 and 3 | W.S.W.<br>S.W. by W. | 26 | 13·09 | 10 |
| August - - - | 21 | 0 | 16th | 18 | S. by E. | 34 | 13·44 | 7 |
| September - - | 87 | 1 | 4th | 3 | E.N.E. | 42 | 17·75 | 0 |
| October - - - | 103 | 0 | 31st | 21 | E. by N. | 57 | 16·49 | 10 |
| November - - | 95 | 2 | 1st | 5, 7, and 8 | E. by N. | 56 | 20·68 | 67 |
| December - - | 137 | 4 | 15th | 8 | S.E. | 40 | 20·75 | 27 |

TABLE V.—*continued.*

1861.

| Months. | 30 + | 0 | Maximum Velocity observed. | | | | Absolute Hourly Velocity for the Month. | Hours lost. |
|---|---|---|---|---|---|---|---|---|
| | | | Day. | Hour. | D. | V. | | |
| January - - | 22 | 0 | 10th | 14 | W. by S. | 46 | 16·99 | 0 |
| February - - | 91 | 0 | 25th | 6 | E. by N. | 47 | 19·20 | 8 |
| March - - | 87 | 0 | 22nd | 10 | W. by S. | 49 | 17·83 | 0 |
| April - - | 64 | 0 | 5th | 18 | N.W. by W. | 43 | 18·03 | 0 |
| May - - - | 9 | 0 | 22nd | 17 and 19 | S.S.E. | 35 | 15·93 | 0 |
| June - - - | 3 | 6 | 7th | 3 | S. by E. | 34 | 12·92 | 0 |
| July - - - | 0 | 0 | 10th | 18 | S. | 28 | 12·51 | 0 |
| August - - | 16 | 0 | 21st | 17 | E. by N. | 37 | 14·28 | 152 |
| September - - | 3 | 1 | 27th | 19 | S.E. | 35 | 10·95 | 0 |
| October - - | 80 | 6 | 25th | 15 | E. by N. | 45 | 14·59 | 0 |
| November - - | 127 | 0 | 16th | 3 | W. by N. | 43 | 19·87 | 0 |
| December - - | 156 | 0 | 31st | 0 | N.W. | 51 | 21·18 | 0 |

1862.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| January - - | 124 | 0 | 28th | 0 and 2 | N.W. by W. | 46 | 19·34 | 0 |
| February - - | 81 | 0 | 28th | 17 | W. by S. | 45 | 19·79 | 56 |
| March - - | 121 | 0 | 7th | 14 | W.S.W. | 51 | 20·51 | 0 |
| April - - | 80 | 0 | 1st | 1 | W. by N. | 49 | 16·56 | 19 |
| May - - - | 12 | 0 | 15th | 20 | E. | 33 | 14·05 | 0 |
| | | | 28th | 9 | S. by E. | | | |
| June - - - | 2 | 1 | 15th | 19 | S.W. by W. | 34 | 14·42 | 0 |
| July - - - | 0 | 0 | 22nd | 2 | S.W. | 28 | 14·45 | 2 |
| | | | | 9 | S.W. by W. | | | |
| August - - | 2 | 1 | 17th | 17 | S.E. by E. | 35 | 11·83 | 0 |
| September - - | 0 | 3 | 4th | 0 | N.E. by E. | 27 | 12·76 | 2 |
| October - - - | 61 | 0 | 14th | 11 | S.E. | 47 | 18·44 | 232 |
| | | | | 19 | S.E. by E. | | | |
| November - - | 62 | 1 | 16th | 18 | E.N.E. | 48 | 19·82 | 51 |
| December - - | 55 | 0 | 18th | 12 | N.N.W. | 50 | 19·53 | 0 |

1863.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| January - - | 118 | 0 | 21st | 20 | S.E. | 50 | 19·31 | 74 |
| February - - | 52 | 0 | 3rd | 10 and 11 | W. | 39 | 17·34 | 0 |
| | | | 6th | 6 and 9 | E.N.E.; E. by N. | | | |
| March - - | 96 | 0 | 21st | 6 and 8 | E.N.E. | 40 | 19·76 | 0 |
| | | | 23rd | 19 | N.E. by E. | | | |

## TABLE VI.

ABSTRACT, showing the MONTHLY MEANS of the BAROMETER and DRY and WET BULB THERMOMETERS at each of the under-mentioned hours, from April 1859 to March 1862 inclusive, at the station of the Royal Engineers at Bermuda. Latitude, 32° 22′ 57″ N.; Longitude, 64° 40′ 0″ W.; Height above the sea, 123 feet.

| MONTH. | 3.30 A.M. | | | 9.30 A.M. | | | 3.30 P.M. | | | 9.30 P.M. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | |
| | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. |
| **1859–60.** | In. | ° | ° | In. | ° | ° | In. | ° | ° | In. | ° | ° |
| April - - | 29·866 | 62·7 | 59·2 | 29·905 | 64·8 | 61·5 | 29·872 | 67·2 | 62·8 | 29·892 | 64·1 | 60·5 |
| May - - | 29·897 | 69·3 | 67·9 | 29·918 | 71·9 | 70·2 | 29·891 | 74·3 | 71·4 | 29·912 | 70·7 | 69·1 |
| June - - | 30·090 | 71·8 | 69·2 | 30·110 | 75·4 | 71·5 | 30·071 | 78·6 | 73·6 | 30·091 | 74·0 | 70·6 |
| July - - | 29·983 | 75·0 | 71·8 | 29·998 | 77·6 | 74·1 | 29·969 | 79·9 | 75·4 | 29·978 | 77·2 | 73·3 |
| August - - | ·993 | 76·8 | 73·5 | 30·012 | 78·6 | 75·4 | ·978 | 81·5 | 76·7 | ·991 | 78·0 | 74·8 |
| September - | ·969 | 75·5 | 73·4 | 29·970 | 77·9 | 75·0 | ·941 | 80·2 | 76·2 | ·949 | 77·2 | 74·2 |
| October - - | ·889 | 70·9 | 67·2 | 29·898 | 72·4 | 69·3 | ·836 | 74·5 | 69·5 | ·869 | 71·2 | 67·5 |
| November - | ·994 | 68·2 | 64·6 | 30·019 | 68·7 | 65·9 | ·962 | 69·6 | 66·3 | ·998 | 68·1 | 65·5 |
| December - | 29·998 | 64·0 | 60·9 | 29·980 | 65·2 | 62·1 | 29·924 | 67·2 | 63·1 | 29·947 | 65·3 | 61·8 |
| January - - | 30·052 | 62·0 | 58·6 | 30·073 | 64·2 | 60·8 | 30·027 | 66·9 | 62·8 | 30·054 | 64·2 | 60·7 |
| February - | 30·002 | 61·1 | 57·5 | 30·019 | 62·1 | 59·2 | 29·972 | 63·0 | 59·7 | 29·998 | 62·6 | 58·7 |
| March - - | 29·882 | 61·4 | 59·0 | 29·893 | 63·2 | 60·4 | 29·849 | 65·9 | 61·5 | 29·878 | 63·0 | 60·0 |
| **1860–61.** | | | | | | | | | | | | |
| April - - | 29·906 | 63·1 | 58·9 | 29·915 | 65·4 | 61·2 | 29·879 | 67·6 | 62·7 | 29·897 | 65·1 | 61·1 |
| May - - | ·857 | 66·3 | 61·9 | ·878 | 68·5 | 63·5 | ·851 | 71·5 | 65·8 | ·868 | 67·1 | 63·2 |
| June - - | ·851 | 70·3 | 68·1 | 29·865 | 72·2 | 69·6 | ·842 | 74·4 | 71·1 | ·863 | 71·6 | 69·1 |
| July - - | ·997 | 76·4 | 74·3 | 30·007 | 78·6 | 75·3 | ·987 | 80·2 | 76·2 | ·993 | 76·4 | 74·2 |
| August - - | ·925 | 77·2 | 74·5 | 29·935 | 79·1 | 75·8 | ·915 | 81·9 | 77·1 | ·922 | 78·1 | 74·9 |
| September - | ·922 | 75·4 | 72·4 | ·933 | 76·4 | 73·0 | ·907 | 78·5 | 74·0 | ·925 | 75·5 | 72·2 |
| October - - | ·910 | 73·6 | 70·3 | ·932 | 74·2 | 71·0 | ·892 | 76·2 | 72·1 | ·913 | 73·9 | 70·7 |
| November - | ·807 | 66·9 | 63·0 | ·838 | 67·8 | 63·8 | ·797 | 69·5 | 64·5 | ·808 | 67·6 | 63·8 |
| December - | 29·899 | 61·3 | 57·4 | 29·909 | 62·5 | 59·0 | ·882 | 64·5 | 59·6 | 29·901 | 62·8 | 58·6 |
| January - - | 30·012 | 60·4 | 56·5 | 30·037 | 61·1 | 57·7 | 29·982 | 63·5 | 58·8 | 30·012 | 61·0 | 57·0 |
| February - | 30·049 | 61·8 | 59·0 | ·073 | 62·7 | 59·7 | 30·034 | 65·6 | 61·6 | ·058 | 62·7 | 59·8 |
| March - - | 29·992 | 61·2 | 57·1 | 30·061 | 62·5 | 57·9 | 29·971 | 66·0 | 60·0 | 30·010 | 62·4 | 57·7 |

TABLE VI.—ABSTRACT, showing the MONTHLY MEANS of the BAROMETER, &c.—*continued.*

| MONTH. | 1861–62. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3.30 A.M. | | | 9.30 A.M. | | | 3.30 P.M. | | | 9.30 P.M. | | |
| | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | |
| | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. |
| | In. | ° | ° | In. | ° | ° | In. | ° | ° | In. | ° | ° |
| April - - | 29·910 | 62·1 | 57·9 | 29·926 | 64·0 | 58·8 | 29·893 | 66·7 | 61·0 | 29·930 | 62·3 | 57·8 |
| May - - | ·864 | 67·1 | 63·0 | 29·904 | 69·0 | 65·1 | ·882 | 71·5 | 66·6 | ·905 | 67·7 | 63·9 |
| June - - | 29·944 | 72·2 | 69·5 | 30·004 | 73·8 | 70·6 | 29·942 | 76·8 | 72·0 | 29·951 | 72·9 | 70·3 |
| July - - | 30·035 | 77·3 | 74·0 | ·072 | 79·2 | 75·0 | 30·027 | 82·3 | 76·1 | 30·047 | 78·2 | 74·4 |
| August - - | 29·981 | 78·8 | 74·2 | 30·001 | 80·7 | 75·4 | 29·969 | 84·0 | 76·9 | 29·985 | 79·5 | 74·8 |
| September - | ·957 | 77·4 | 73·0 | 29·972 | 78·9 | 74·1 | ·917 | 82·5 | 75·5 | ·968 | 78·2 | 73·6 |
| October - - | ·920 | 74·1 | 70·3 | ·935 | 75·0 | 71·4 | ·896 | 78·2 | 72·9 | ·927 | 74·9 | 71·0 |
| November - | ·774 | 65·8 | 60·6 | ·794 | 67·2 | 61·8 | ·739 | 69·3 | 62·8 | ·774 | 66·7 | 61·5 |
| December - | 29·964 | 61·0 | 56·4 | 29·988 | 62·0 | 57·6 | ·931 | 63·7 | 58·1 | 29·959 | 62·1 | 57·4 |
| January - - | 30·005 | 62·5 | 59·5 | 30·031 | 63·4 | 59·9 | ·965 | 65·6 | 61·7 | 30·016 | 63·0 | 60·0 |
| February - | 29·939 | 61·3 | 57·7 | 29·956 | 63·1 | 59·6 | ·919 | 65·3 | 60·6 | 29·924 | 62·7 | 59·0 |
| March - - | 29·793 | 60·4 | 56·3 | 29·837 | 61·5 | 57·6 | 29·801 | 63·1 | 58·3 | 29·833 | 61·6 | 57·5 |

## TABLE VII.

MEAN MONTHLY VALUES of BAROMETER and THERMOMETER for the hours specified, and for the three years, April 1859 to March 1862, combined.

| MONTH. | Three Years combined. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3.30 A.M. | | | 9.30 A.M. | | | 3.30 P.M. | | | 9.30 P.M. | | |
| | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | | Barometer corrected for Index Error and to 32°. | Thermometers (corrected). | |
| | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. |
| | In. | ° | ° | In. | ° | ° | In. | ° | ° | In. | ° | ° |
| January - - | 30·023 | 61·6 | 58·2 | 30·047 | 62·9 | 59·5 | 29·991 | 65·3 | 61·1 | 30·027 | 62·7 | 59·2 |
| February - | 29·997 | 61·4 | 58·1 | 30·016 | 62·6 | 59·5 | ·975 | 64·6 | 60·6 | 29·993 | 62·7 | 59·2 |
| March - - | ·889 | 61·0 | 57·5 | 29·930 | 62·4 | 58·6 | ·874 | 65·0 | 59·9 | ·907 | 62·3 | 58·4 |
| April - - | ·894 | 62·6 | 58·7 | ·915 | 64·7 | 60·5 | ·881 | 67·2 | 62·2 | ·906 | 63·8 | 59·8 |
| May - - | ·873 | 67·6 | 64·3 | ·900 | 69·8 | 66·3 | ·875 | 72·4 | 67·9 | ·895 | 68·5 | 65·4 |
| June - - | 29·962 | 71·4 | 68·9 | 29·993 | 73·8 | 70·6 | ·952 | 76·6 | 72·2 | 29·968 | 72·8 | 70·0 |
| July - - | 30·005 | 76·2 | 73·4 | 30·026 | 78·5 | 74·8 | ·994 | 80·8 | 75·9 | 30·006 | 77·3 | 74·0 |
| August - - | 29·966 | 77·6 | 74·1 | 29·983 | 79·5 | 75·5 | ·954 | 82·5 | 76·9 | 29·966 | 78·5 | 74·8 |
| September - | ·949 | 76·1 | 72·9 | ·958 | 77·7 | 74·0 | ·922 | 80·4 | 75·2 | ·947 | 77·0 | 73·3 |
| October - - | ·906 | 72·9 | 69·3 | ·922 | 73·9 | 70·6 | ·875 | 76·3 | 71·5 | ·903 | 73·3 | 69·7 |
| November - | ·858 | 67·0 | 62·7 | ·884 | 67·9 | 63·8 | ·833 | 69·5 | 64·5 | ·860 | 67·5 | 63·6 |
| December - | 29·954 | 62·1 | 58·2 | 29·959 | 63·2 | 59·6 | 29·912 | 65·1 | 60·3 | 29·936 | 63·4 | 59·3 |
| Mean - - | 29·940 | 68·1 | 64·7 | 29·961 | 69·7 | 66·1 | 29·840 | 72·1 | 67·4 | 29·943 | 69·2 | 65·6 |

## TABLE VIII.

SEPARATE MONTHLY and YEARLY RESULTS of BAROMETER and THERMOMETERS obtained from the four Daily Observations.

| MONTHS. | 1859. | | | 1860. | | | 1861. | | | 1862. | | | Mean of three similar Months. | | | MONTHS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Barometer. | Thermometers. | | Barometer. | Thermometers. | | Barometer. | Thermometers. | | Barometer. | Thermometers. | | Barometer. | Thermometers. | | |
| | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | | Dry Bulb. | Wet Bulb. | |
| | In. | ° | ° | In. | ° | ° | In. | ° | ° | In. | ° | ° | In. | ° | ° | |
| January - | — | — | — | 30·052 | 64·3 | 60·7 | 30·011 | 61·5 | 57·5 | 30·004 | 63·6 | 60·3 | 30·022 | 63·1 | 59·5 | January. |
| February - | — | — | — | 29·998 | 62·2 | 58·8 | ·054 | 63·2 | 60·0 | 29·935 | 63·1 | 59·2 | 29·996 | 62·8 | 59·3 | February. |
| March - | — | — | — | ·876 | 63·4 | 60·2 | 30·009 | 63·0 | 58·2 | 29·816 | 61·7 | 57·4 | ·900 | 62·7 | 58·6 | March. |
| April - | 29·884 | 64·7 | 61·0 | ·899 | 65·3 | 61·0 | 29·915 | 63·8 | 58·9 | — | — | — | ·899 | 64·6 | 60·3 | April. |
| May - | 29·905 | 71·6 | 69·7 | ·864 | 68·4 | 63·6 | ·889 | 68·8 | 64·7 | — | — | — | ·886 | 69·6 | 66·0 | May. |
| June - | 30·091 | 75·0 | 71·2 | ·855 | 72·1 | 69·5 | 29·960 | 73·9 | 70·6 | — | — | — | 29·969 | 73·7 | 70·4 | June. |
| July - | 29·982 | 77·4 | 73·7 | ·996 | 77·9 | 75·0 | 30·045 | 79·3 | 74·9 | — | — | — | 30·008 | 78·2 | 74·5 | July. |
| August - | ·994 | 78·7 | 75·1 | ·924 | 79·1 | 75·6 | 29·984 | 80·8 | 75·3 | — | — | — | 29·967 | 79·5 | 75·3 | August. |
| September - | ·957 | 77·7 | 74·7 | ·922 | 76·5 | 72·9 | ·954 | 79·3 | 74·1 | — | — | — | ·944 | 77·8 | 73·9 | September. |
| October - | ·873 | 72·3 | 68·4 | ·912 | 74·5 | 71·0 | ·920 | 75·6 | 71·4 | — | — | — | ·902 | 74·1 | 70·3 | October. |
| November - | ·993 | 68·7 | 65·6 | ·813 | 68·0 | 63·8 | ·770 | 67·3 | 61·7 | — | — | — | ·859 | 68·0 | 63·7 | November. |
| December - | 29·962 | 65·4 | 62·0 | 29·898 | 62·8 | 58·7 | 29·961 | 62·2 | 57·4 | — | — | — | 29·940 | 63·5 | 59·4 | December. |
| Mean - | 29·960* | 72·4 | 69·0 | 29·917 | 69·5 | 65·9 | 29·956 | 69·9 | 65·4 | 29·918† | 62·8 | 59·0 | 29·941 | 69·8 | 65·9 | Mean. |

* Nine months.

† Three months.

# JANUARY – 1872.

1ST 2ND 3RD 4TH 5TH Plate I.

WIND BAR. THER M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER BAR. WIND

## VALENCIA.

MLS. VAPOUR TENSION. INCH. INS. RAINFALL in F. 30·5 30·0 29·5 29·0 28·5 WIND DIRECTION W. S. E. N.

DRY WET BAR. VAP. TEN. RAIN DIREC. 30·24 30·22

Lat. 51°54·36 N. Long. 10 18 10 W. Bar. 23·0 Ft. Above M.S.L.

## ARMAGH.

DRY WET BAR. VAP. TEN. RAIN DIREC. 30·24 30·22 28·33

Lat. 54°21·3 N. Long. 6 38·5 W. Bar. 207·3 Ft. Above M.S.L.

## GLASGOW.

Clouds Stopped. 30·24 30·22 28·33

Lat. 55°52·43 N. Long. 4 17·30 W. Bar. 184·0 Ft. Above M.S.L.

## ABERDEEN.

Calm. 30·24 30·22 28·43

Lat. 57°9·513 N. Long. 2 5·596 W. Bar. 88·5 Ft. Above M.S.L.

## FALMOUTH.

30·24 30·22

Lat. 50°9·24 N. Long. 5 3·30 W. Bar. 210·8 Ft. Above M.S.L.

## STONYHURST.

30·24 30·22

Lat. 53°50·40 N. Long. 2 28 10·2 W. Bar. 360·7 Ft. Above M.S.L.

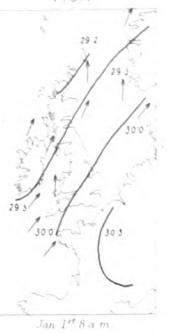
## KEW.

30·24 30·22 28·25

Lat. 51°28·6 N. Long. 0 18 4·1 W. Bar. 34·0 Ft. Above M.S.L.

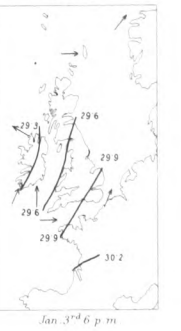
WIND BAR. THER M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER BAR. WIND

FIG. 1



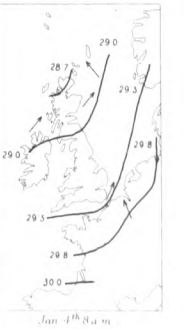

Jan 1st 8 a.m.

FIG. 2




Jan 3rd 6 p.m

FIG. 3




Jan 4th 8 a.m

FIG. 4

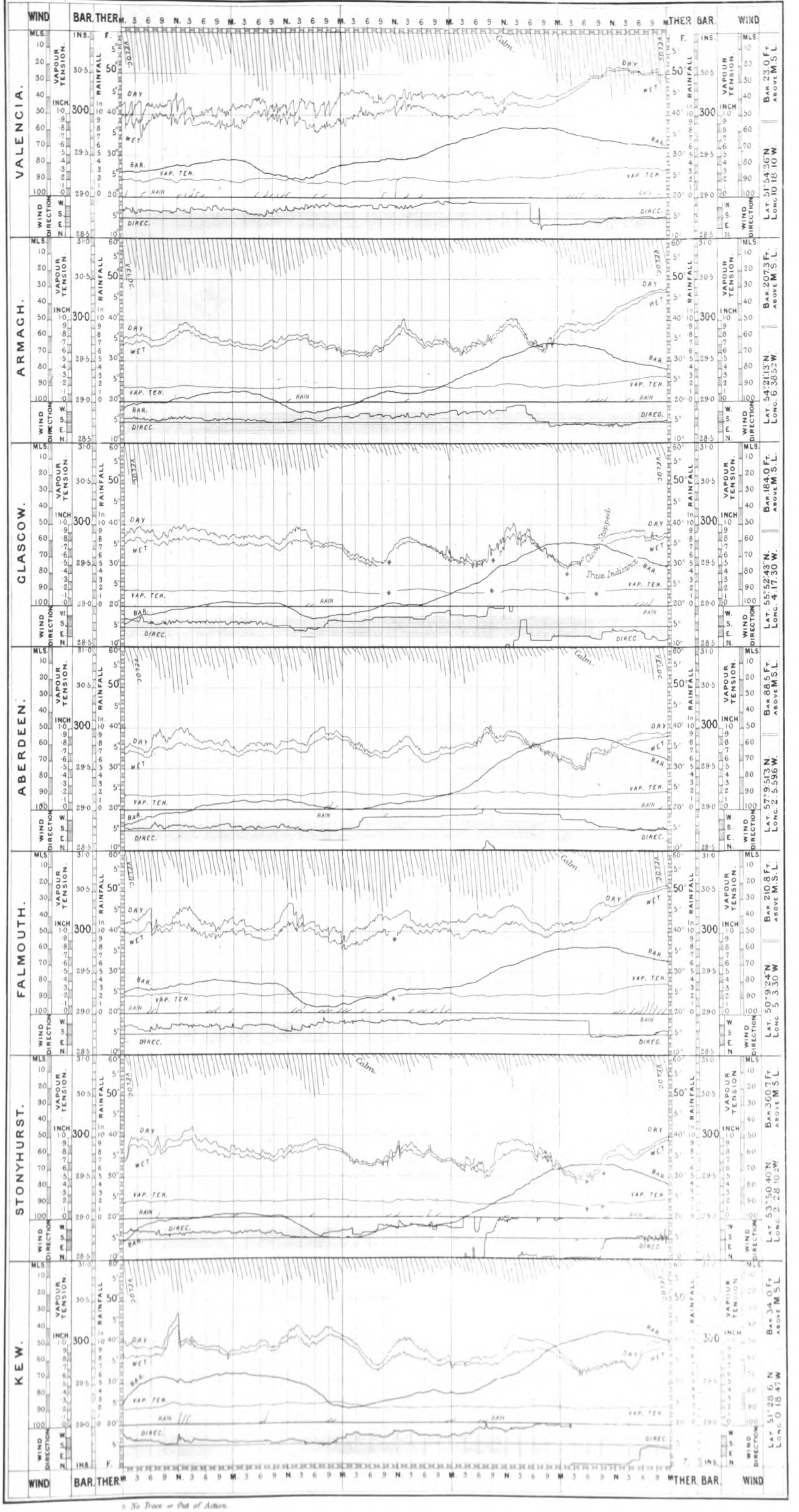
Jan 5th 8 a.m

x No Trace or Out of Action

# JANUARY_1872.

6TH 7TH 8TH 9TH 10TH

Plate II.




s No Trace or Out of Action.

# JANUARY, 1872.

Plate III.

11TH 12TH 13TH 14TH 15TH

VALENCIA. Bar. 23.0 Ft. above M.S.L. Lat. 51°54'36"N. Long. 10 18 10 W.

ARMAGH. Bar. 207.3 Ft. above M.S.L. Lat. 54°21'13"N. Long. 6 38 3 W.

GLASGOW. Bar. 184.0 Ft. above M.S.L. Lat. 55°52'43"N. Long. 4 17 30 W.

ABERDEEN. Bar. 88.5 Ft. above M.S.L. Lat. 57°9'51"N. Long. 2 5 56 W.

FALMOUTH. Bar. 210.8 Ft. above M.S.L. Lat. 50°9'24"N. Long. 5 3 30 W.

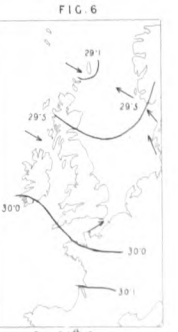
STONYHURST. Bar. 360.7 Ft. above M.S.L. Lat. 53°50'40"N. Long. 2 28 10 W.

KEW. Bar. 34.0 Ft. above M.S.L. Lat. 51°28'6"N. Long. 0 18 47 W.

FIG. 5

Jan. 13th 8 a.m.

FIG. 6




Jan. 14th 8 a.m.

* No Trace or Out of Action

# JANUARY, 1872.

16TH 17TH 18TH 19TH 20TH Plate IV.

VALENCIA. Bar. 23.0 Ft. above M.S.L. Lat. 51°54'36"N. Long. 10.18.10 W.

ARMAGH. Bar. 207.3 Ft. above M.S.L. Lat. 54°21'13"N. Long. 6.38.52 W.

GLASCOW. Bar. 184.0 Ft. above M.S.L. Lat. 55°52'43"N. Long. 4.17.30 W.

ABERDEEN. Bar. 88.5 Ft. above M.S.L. Lat. 57°9'51"N. Long. 2.5.96 W.

FALMOUTH. Bar. 210.8 Ft. above M.S.L. Lat. 50°9'24"N. Long. 5.3.30 W.

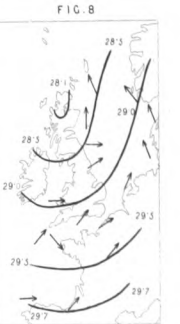
STONYHURST. Bar. 360.7 Ft. above M.S.L. Lat. 53°50'40"N. Long. 2.28.10 W.

KEW. Bar. 34.0 Ft. above M.S.L. Lat. 51°28.6'N. Long. 0.18.47 W.

FIG. 7

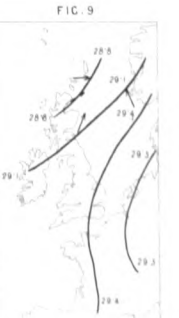
Jan. 17th 8 a.m.

FIG. 8



Jan. 18th 8 a.m.

FIG. 9



Jan. 19th 8 a.m.

§ No Trace or Out of Action.

# JANUARY, 1872.

21ST 22ND 23RD 24TH 25TH

Plate V.

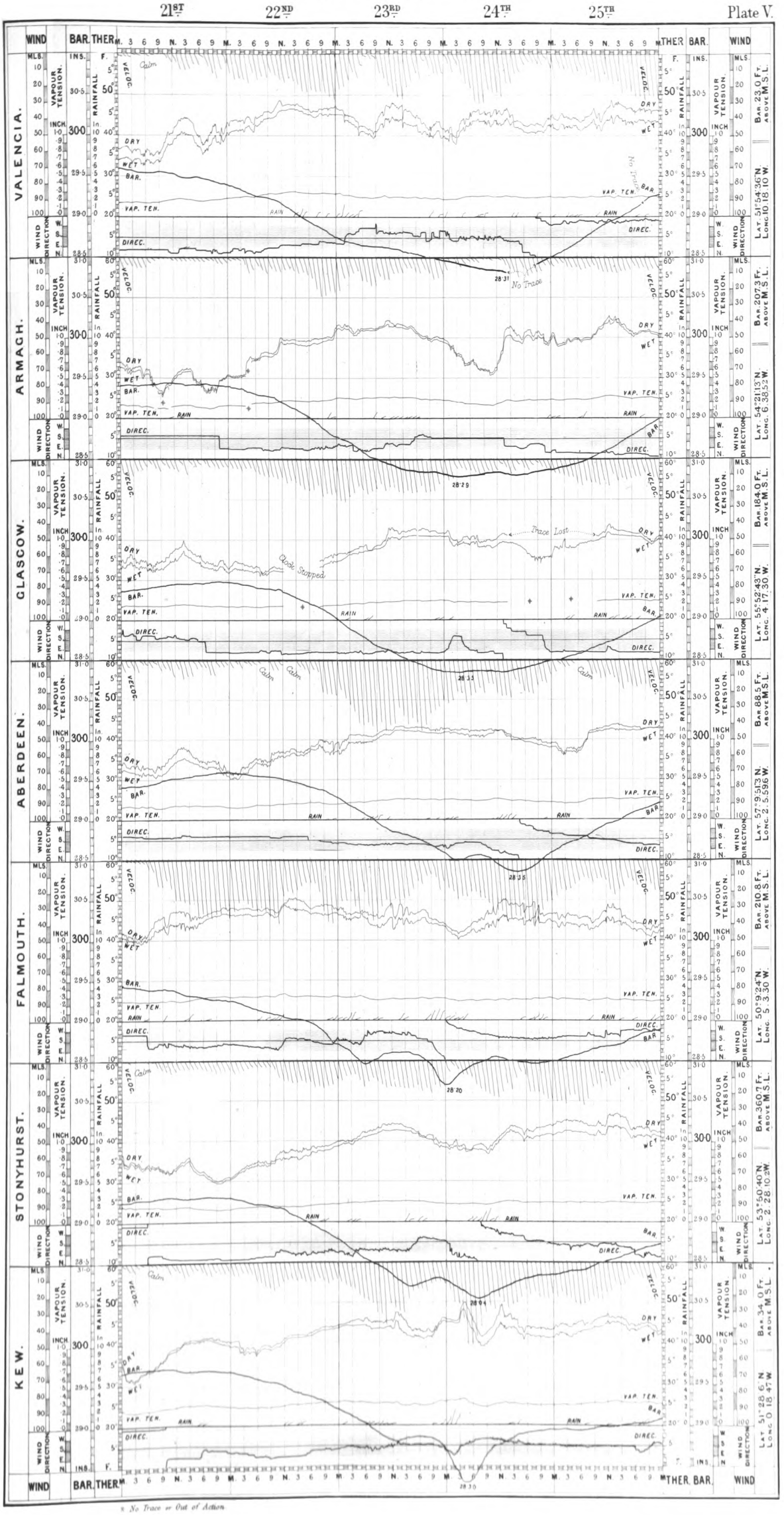
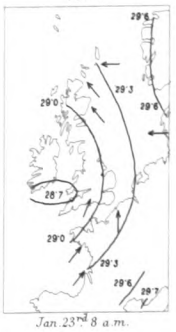
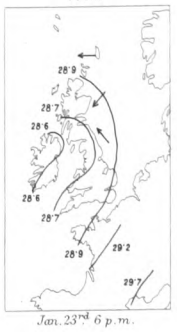



FIG. 10



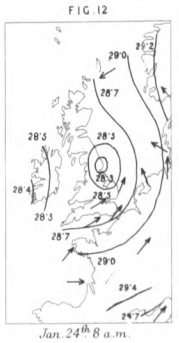
Jan. 23rd 8 a.m.

FIG. 11



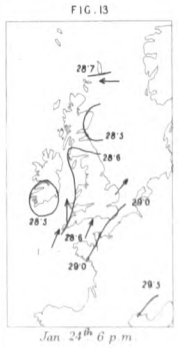
Jan. 23rd 6 p.m.

FIG. 12



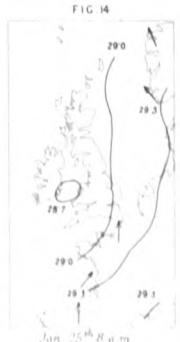
Jan. 24th 8 a.m.

FIG. 13



Jan. 24th 6 p.m.

FIG. 14



Jan. 25th 8 a.m.

× No Trace or Out of Action

# JANUARY, 1872.

26TH 27TH 28TH 29TH 30TH Plate VI.

## VALENCIA.

Bar. 23.0 Ft. above M.S.L.
Lat. 51°54'36"N. Long. 10 18 10 W.

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.
Lat. 54°21'13"N. Long. 6 38 52 W.

## GLASCOW.

Bar. 184.0 Ft. above M.S.L.
Lat. 55°52'48"N. Long. 4 17 30 W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.
Lat. 57°9'53"N. Long. 2 5 36 W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.
Lat. 50°9'34"N. Long. 5 3 30 W.

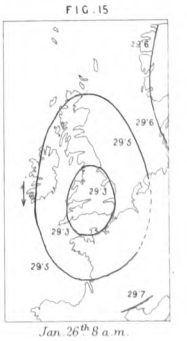
## STONYHURST.

Bar. 360.7 Ft. above M.S.L.
Lat. 53°50'40"N. Long. 2 28 10 2 W.

## KEW.

Bar. 34.0 Ft. above M.S.L.
Lat. 51°28'6"N. Long. 0 18 47 W.

FIG. 15




Jan. 26th 8 a.m.

* No Trace or Out of Action.

# JANUARY – FEBRUARY, 1872.

Plate VII.

31ST | 1ST | 2ND | 3RD | 4TH

## VALENCIA.

Bar. 23.0 Ft. above M.S.L.
Lat. 51°54'36"N. Long. 10.18.10 W.

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.
Lat. 54°21'13"N. Long. 6°38'52"W.

## GLASCOW.

Bar. 184.0 Ft. above M.S.L.
Lat. 55°52'43"N. Long. 4°17'30"W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.
Lat. 57°9'51"3 N. Long. 2°5'596 W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.
Lat. 50°9'24"N. Long. 5°3'30 W.

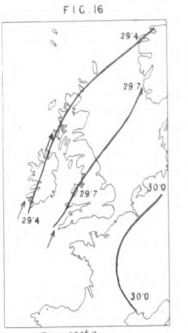
## STONYHURST.

Bar. 360.7 Ft. above M.S.L.
Lat. 53°50'40"N. Long. 2°28'10"W.

## KEW.

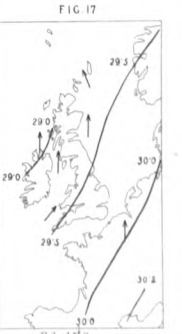
Bar. 34.0 Ft. above M.S.L.
Lat. 51°28'6"N. Long. 0°18'4"W.

FIG. 16




Jan. 31st 8 a.m.

FIG. 17




Feb 1st 8 a.m.

* No Trace or Out of Action.

# FEBRUARY, 1872.

Plate VIII.

5TH 6TH 7TH 8TH 9TH

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M THER. BAR. WIND

## VALENCIA.

MLS. INS. F. RAINFALL VAPOUR TENSION INCH WIND DIRECTION

DRY WET BAR. VAP. TEN. RAIN DIREC. Clock Stopped

BAR 23.0 Ft. ABOVE M.S.L.

LAT. 51° 54' 36" N. LONG. 10 18 10 W.

## ARMAGH.

DRY WET BAR. VAP. TEN. RAIN DIREC.

BAR 207.3 Ft. ABOVE M.S.L.

LAT. 54° 21' 13" N. LONG. 6 38 34 W.

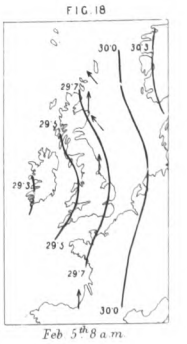
## GLASGOW.

DRY WET BAR. VAP. TEN. RAIN DIREC. Clock Stopped

BAR 184.0 Ft. ABOVE M.S.L.

LAT. 55° 52' 43" N. LONG. 4 17 30 W.

FIG. 18



Feb. 5th 8 a.m.

## ABERDEEN.

DRY WET BAR. VAP. TEN. RAIN DIREC. Calm.

BAR 88.5 Ft. ABOVE M.S.L.

LAT. 57° 9' 51" N. LONG. 2 5.596 W.

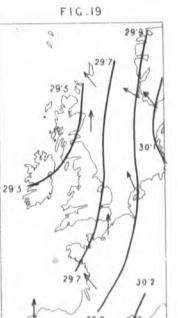
## FALMOUTH.

DRY WET BAR. VAP. TEN. RAIN DIREC.

BAR. 210.8 Ft. ABOVE M.S.L.

LAT. 50° 9' 24" N. LONG. 5 3.30 W.

FIG. 19



Feb. 6th 8 a.m.

## STONYHURST.

DRY WET BAR. VAP. TEN. RAIN DIREC. Calm Calm Calm Trace Inisland

BAR 360.7 Ft. ABOVE M.S.L.

LAT. 53° 50' 40" N. LONG. 2 28 10.2 W.

## KEW.

DRY WET BAR. VAP. TEN. RAIN DIREC. Gas Out

BAR 34.0 Ft. ABOVE M.S.L.

LAT. 51° 28' 6" N. LONG. 0 18 47 W.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M THER. BAR. WIND

* No Trace or Out of Action

# FEBRUARY, 1872.

Plate IX.

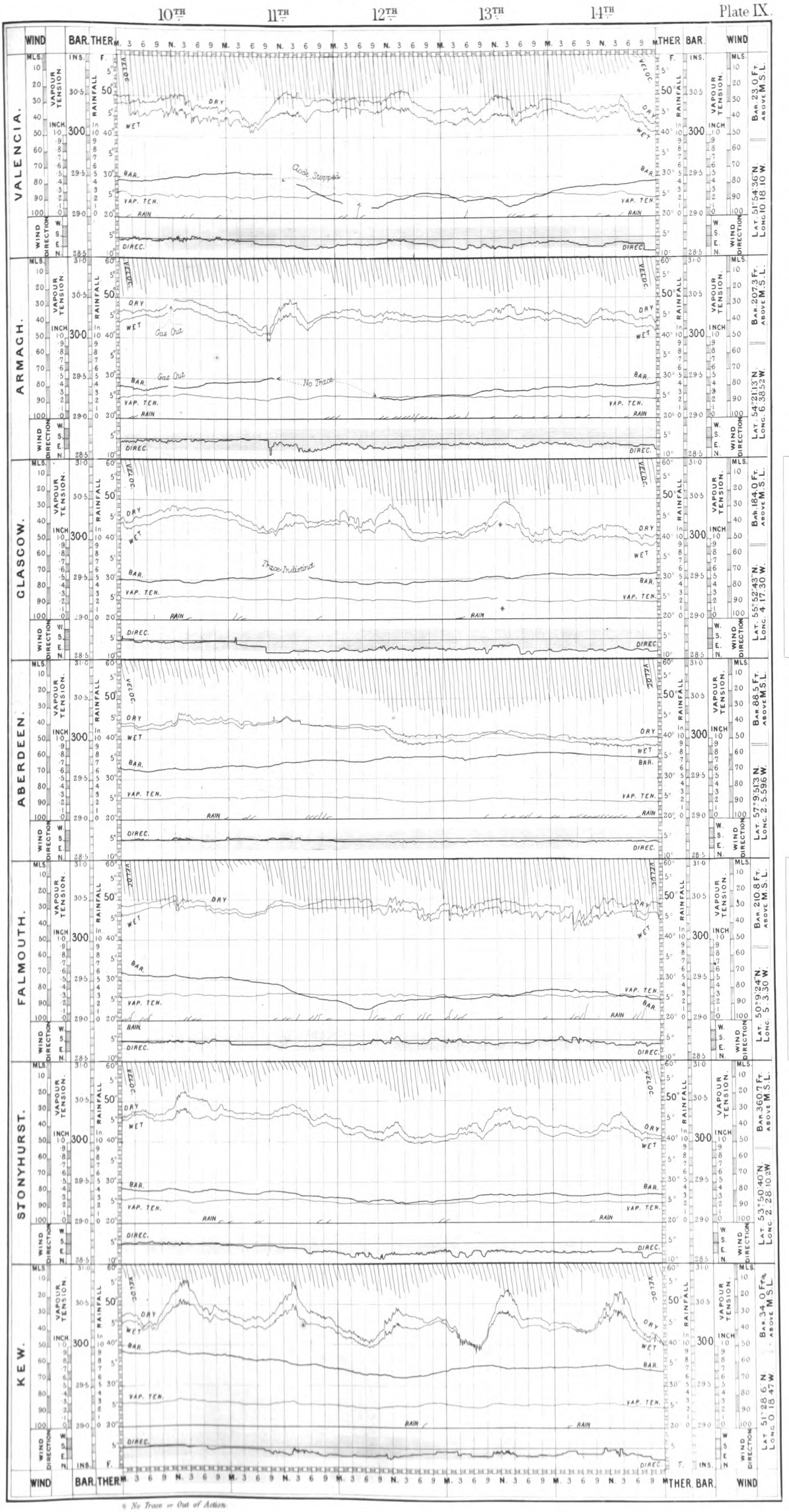
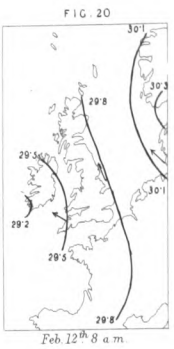
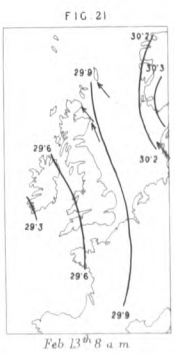



FIG. 20



Feb. 12th 8 a.m.

FIG. 21



Feb. 13th 8 a.m.

* No Trace or Out of Action.

# FEBRUARY, 1872.

Plate X.

15TH 16TH 17TH 18TH 19TH

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

## VALENCIA.

MLS. INS. F. VAPOUR TENSION. RAINFALL WIND DIRECTION

DRY WET BAR. VAP. TEN. DIREC. R.0040 No Trace R.0030 R.0180 R.0230 Clock Stopped

Bar. 23.0 Ft. Above M.S.L.

Lat. 51°54'36"N. Long. 10.18.10 W.

## ARMAGH.

DRY WET BAR. VAP. TEN. RAIN DIREC.

Bar. 207.3 Ft. Above M.S.L.

Lat. 54°21'13"N. Long. 6.38.53 W.

## GLASCOW.

DRY WET BAR. VAP. TEN. RAIN DIREC.

Bar. 184.0 Ft. Above M.S.L.

Lat. 55°52'43"N. Long. 4.17.30 W.

## ABERDEEN.

DRY WET BAR. VAP. TEN. RAIN DIREC.

Bar. 88.5 Ft. Above M.S.L.

Lat. 57°9'51"N. Long. 2.5.56 W.

## FALMOUTH.

DRY WET BAR. VAP. TEN. RAIN DIREC.

Bar. 210.8 Ft. Above M.S.L.

Lat. 50°9'24"N. Long. 5.3.30 W.

## STONYHURST.

DRY WET BAR. VAP. TEN. RAIN DIREC.

Bar. 360.7 Ft. Above M.S.L.

Lat. 53°50'40"N. Long. 2.28.10 W.

## KEW.

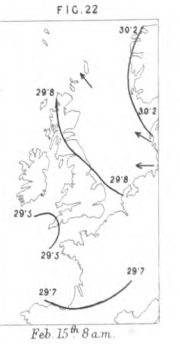
DRY WET BAR. VAP. TEN. RAIN DIREC.

Bar. 34.0 Ft. Above M.S.L.

Lat. 51°28.6'N. Long. 0.18.47 W.

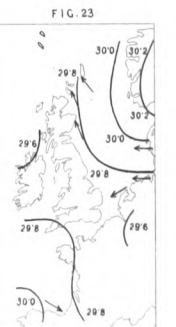
WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

FIG. 22




Feb. 15th 8 a.m.

FIG. 23



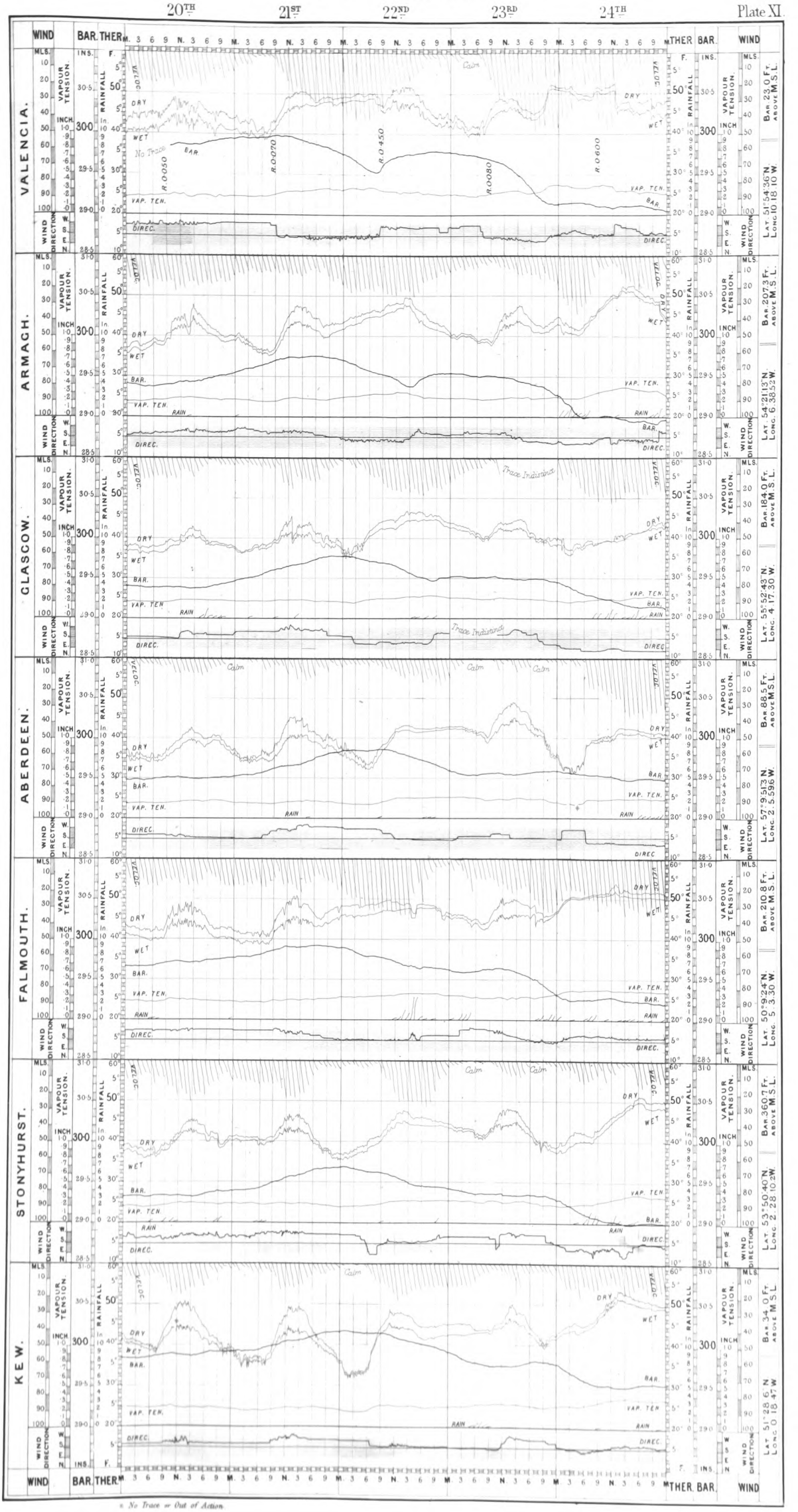

Feb. 16th 8 a.m.

* No Trace or Out of Action.

# FEBRUARY, 1872.

Plate XI.

20TH 21ST 22ND 23RD 24TH




* No Trace or Out of Action.

# FEBRUARY_MARCH, _ 1872.

Plate XII.

25TH | 26TH | 27TH | 28TH | 29TH | 1ST

WIND | BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 | THER BAR | WIND

## VALENCIA.

MLS. | INS. | F. | VAPOUR TENSION. | RAINFALL | WIND DIRECTION

DRY | WET | VAP. TEN. | BAR. | DIREC. | R. 0·540 | R. 0·280 | R. 0·200 | R. 0·240 | R. 0·400 | No Trace

Bar. 23·0 Ft. Above M.S.L.

Lat. 51° 54′ 36″ N. Long. 10 18 10 W.

## ARMAGH.

DRY | WET | VAP. TEN. | BAR. | RAIN | DIREC. | Calm

Bar. 207·3 Ft. Above M.S.L.

Lat. 54° 21′ 13″ N. Long. 6° 38′ 39″ W.

## GLASGOW.

DRY | WET | VAP. TEN. | BAR. | RAIN | DIREC. | No Trace | Out of Action | Calm

Bar. 184·0 Ft. Above M.S.L.

Lat. 55° 52′ 43″ N. Long. 4° 17′ 30″ W.

## ABERDEEN.

DRY | WET | BAR. | VAP. TEN. | RAIN | DIREC.

Bar. 88·5 Ft. Above M.S.L.

Lat. 57° 9′ 51·3 N. Long. 2° 5′ 59·6 W.

## FALMOUTH.

DRY | WET | VAP. TEN. | BAR. | RAIN | DIREC. | Calm

Bar. 210·8 Ft. Above M.S.L.

Lat. 50° 9′ 24″ N. Long. 5° 3′ 30″ W.

## STONYHURST.

DRY | WET | VAP. TEN. | RAIN | BAR. | DIREC. | Calm

Bar. 360·7 Ft. Above M.S.L.

Lat. 53° 50′ 40″ N. Long. 2° 28′ 10·2″ W.

## KEW.

DRY | WET | BAR. | VAP. TEN. | RAIN | DIREC.

Bar. 34·0 Ft. Above M.S.L.

Lat. 51° 28′ 6″ N. Long. 0° 18′ 4″ W.

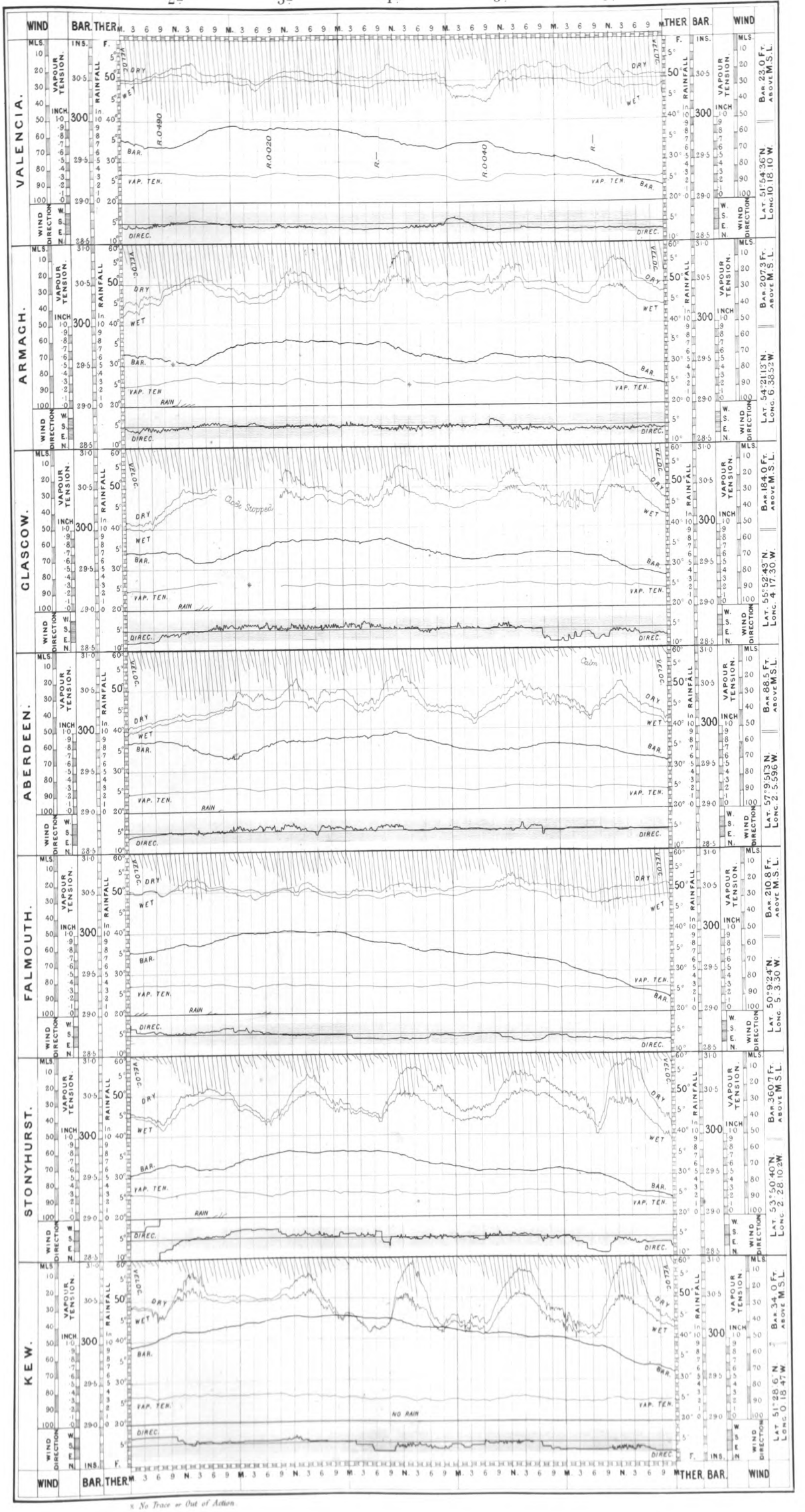
WIND | BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 | THER BAR | WIND

* No Trace or Out of Action.

# M A R C H, — 1872.

2ND 3RD 4TH 5TH 6TH

Plate XIII.

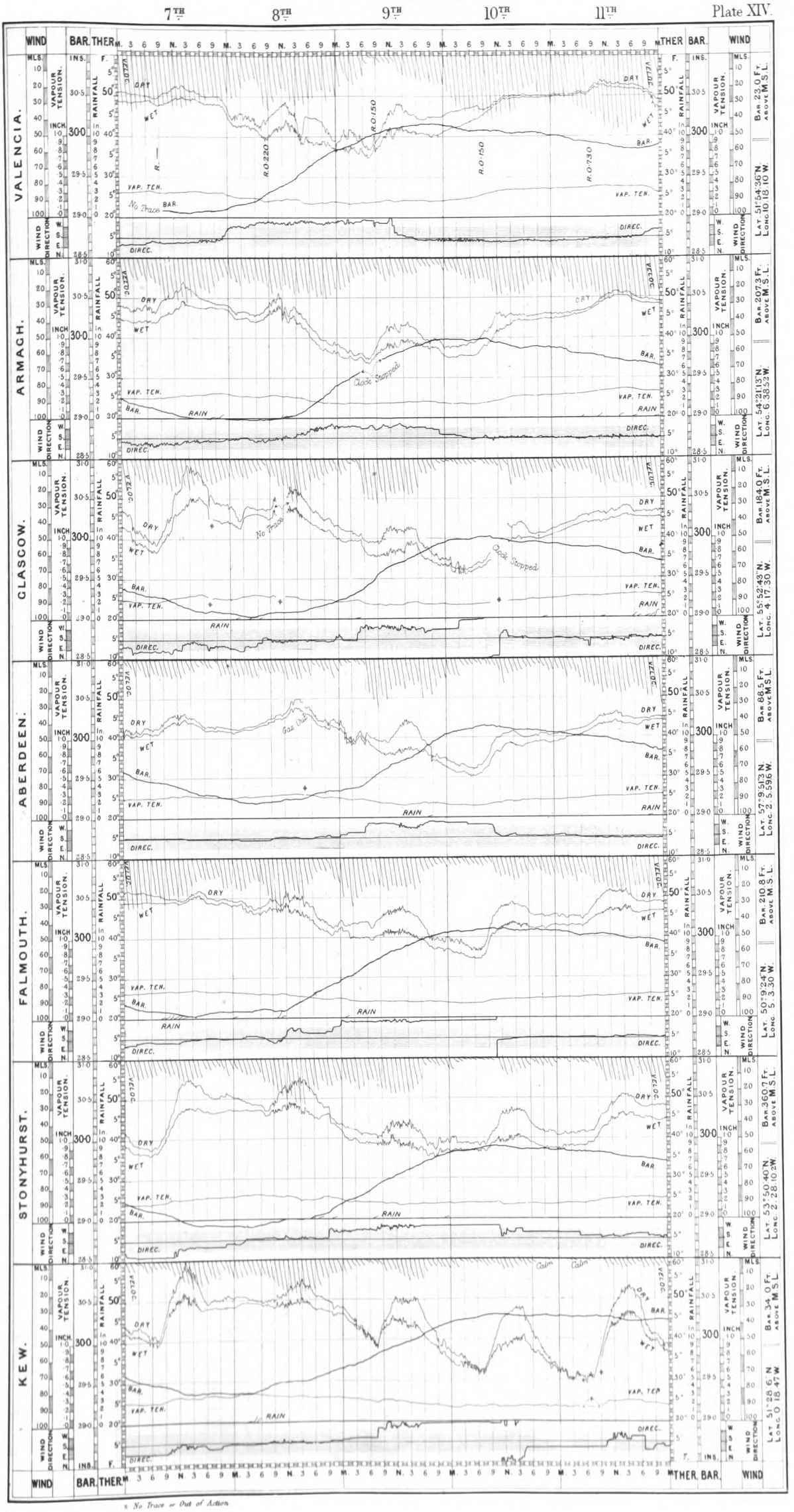



x No Trace or Out of Action.

# M A R C H, 1872.

Plate XIV.

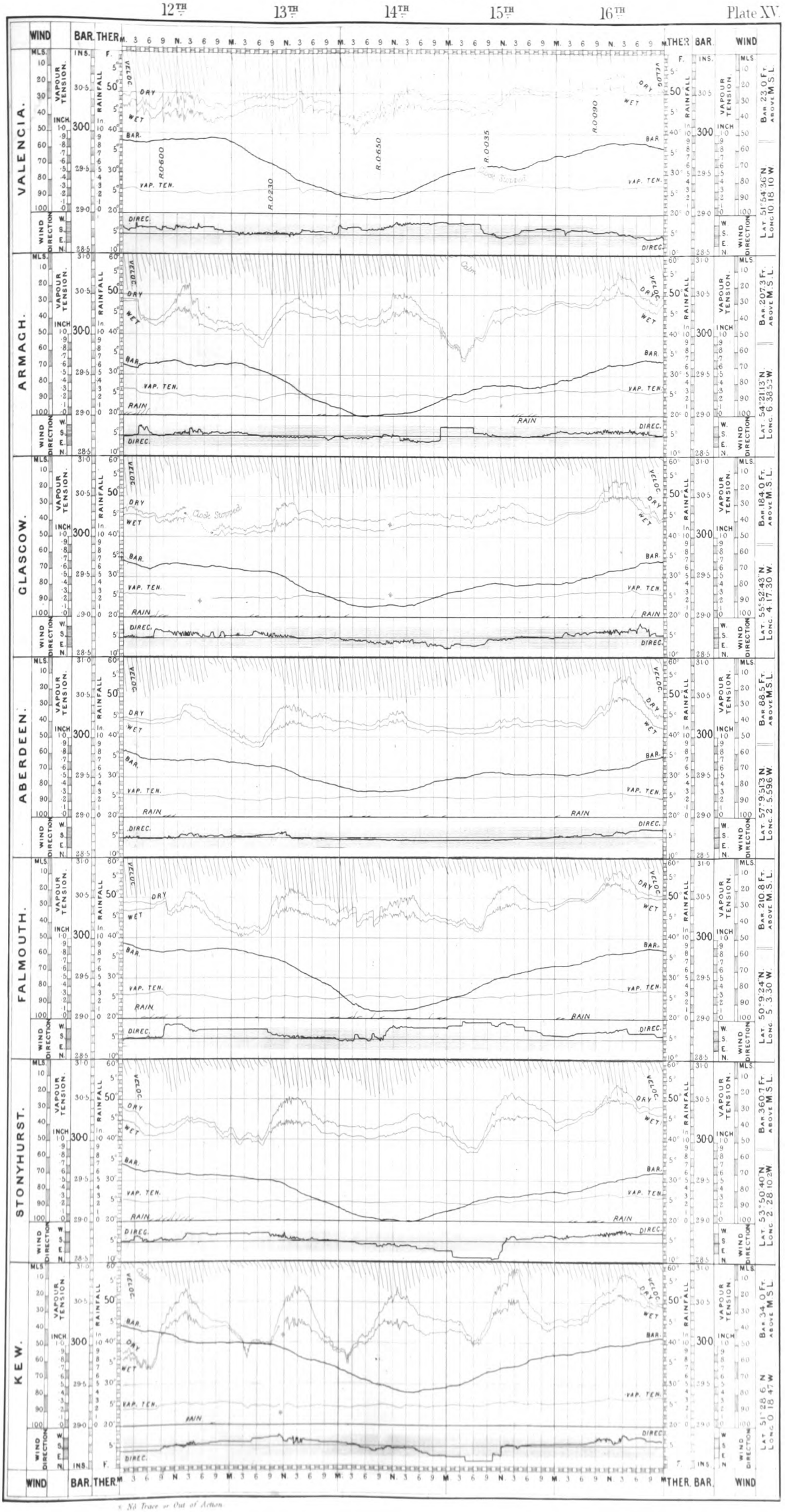
7TH 8TH 9TH 10TH 11TH




* No Trace or Out of Action

# M A R C H, 1872.

12TH 13TH 14TH 15TH 16TH Plate XV.




* Nil Trace or Out of Action

# MARCH, 1872.

Plate XVI.

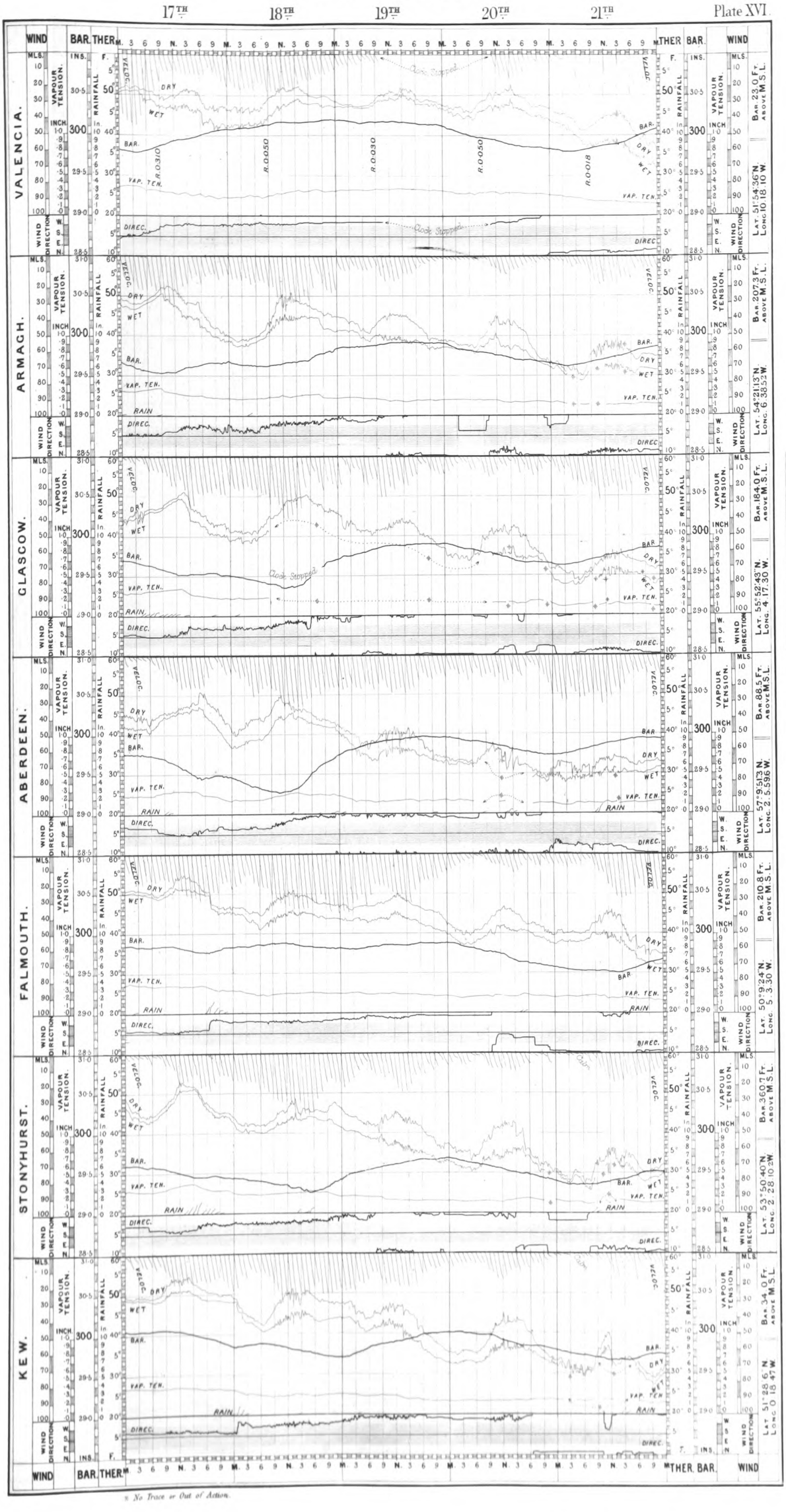
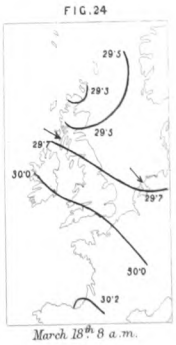
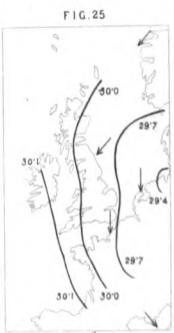



FIG. 24




March 18th 8 a.m.

FIG. 25



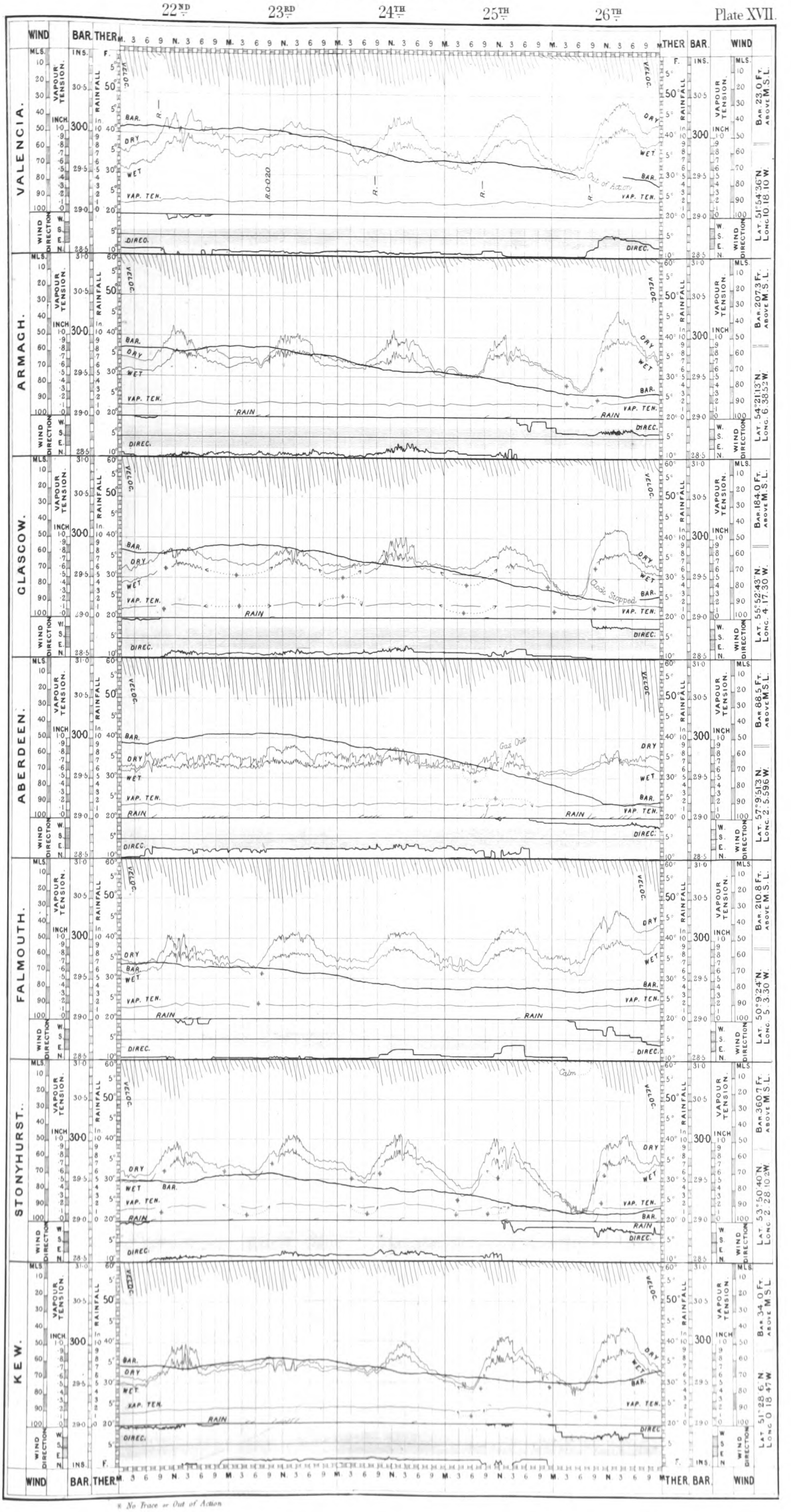

March 19th 8 a.m.

* No Trace or Out of Action.

# M A R C H, — 1872.

22ND | 23RD | 24TH | 25TH | 26TH

Plate XVII.




* No Trace or Out of Action

# MARCH, 1872.

27TH 28TH 29TH 30TH 31ST

Plate XVIII.

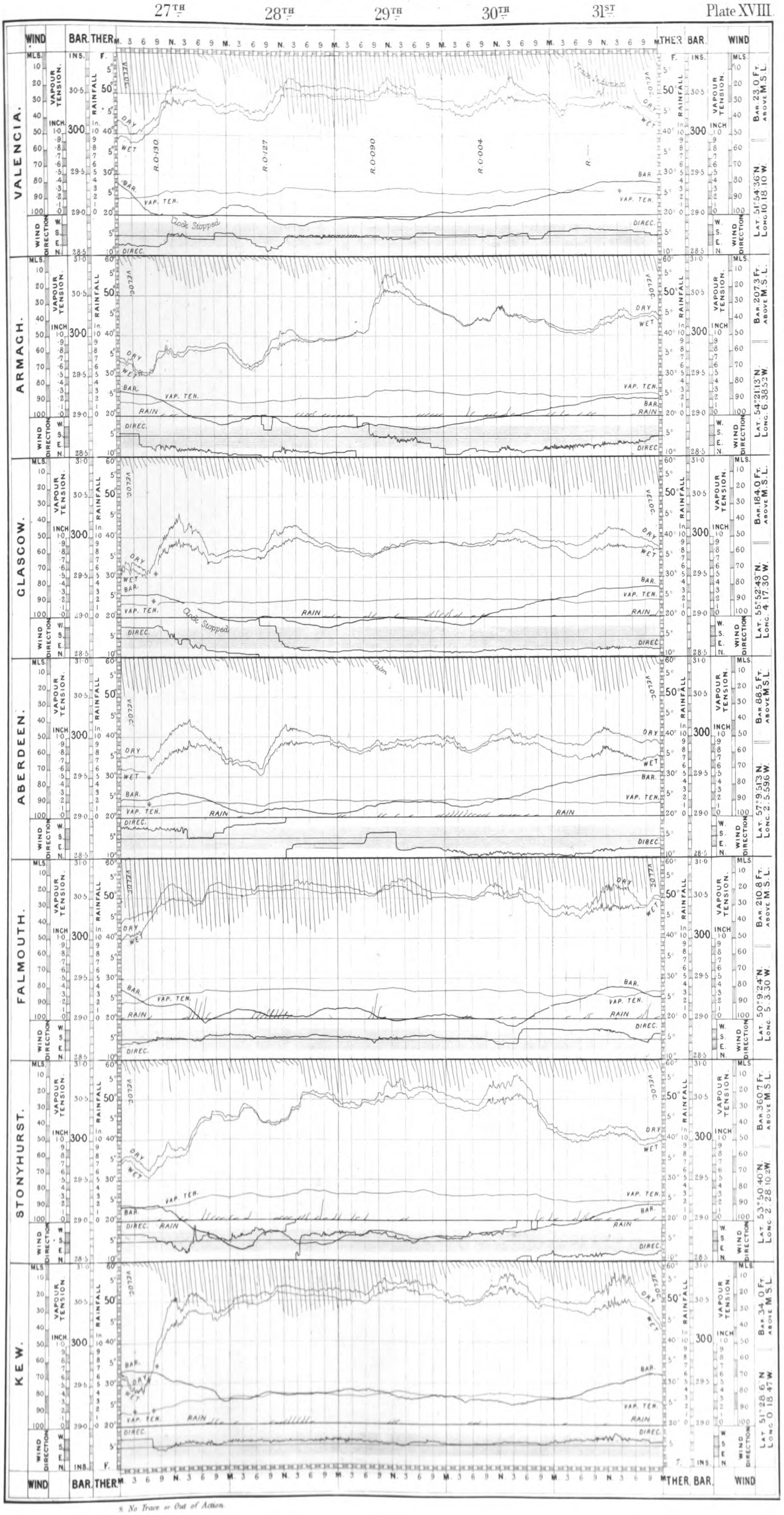
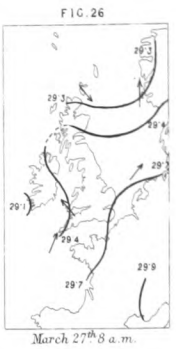
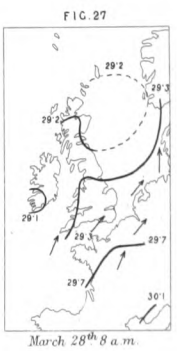



FIG. 26



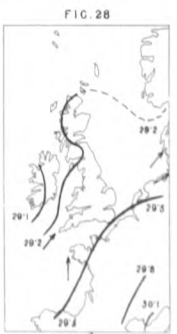
March 27th 8 a.m.

FIG. 27



March 28th 8 a.m.

FIG. 28



March 29th 8 a.m.

* No Trace or Out of Action.

# APRIL, 1872.

1ST 2ND 3RD 4TH 5TH Plate XIX.

## VALENCIA.

BAR. 23.0 Ft. ABOVE M.S.L.
LAT. 51°54'36" N. LONG. 10°18'10" W.

## ARMAGH.

BAR. 207.3 Ft. ABOVE M.S.L.
LAT. 54°21'13" N. LONG. 6°38'3" W.

## GLASCOW.

BAR. 184.0 Ft. ABOVE M.S.L.
LAT. 55°52'48" N. LONG. 4°17'30" W.

## ABERDEEN.

BAR. 88.5 Ft. ABOVE M.S.L.
LAT. 57°9'53" N. LONG. 2°5'56" W.

## FALMOUTH.

BAR. 210.8 Ft. ABOVE M.S.L.
LAT. 50°9'24" N. LONG. 5°3'30" W.

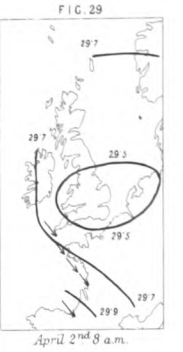
## STONYHURST.

BAR. 360.7 Ft. ABOVE M.S.L.
LAT. 53°50'40" N. LONG. 2°28'10.2" W.

## KEW.

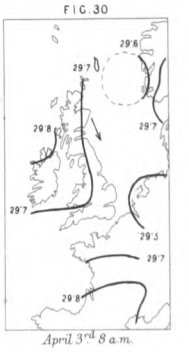
BAR. 34.0 Ft. ABOVE M.S.L.
LAT. 51°28'6" N. LONG. 0°18'47" W.

FIG. 29



April 2nd 8 a.m.

FIG. 30



April 3rd 8 a.m.

FIG. 31

April 4th 8 a.m.

x No Trace or Out of Action

APRIL, 1872.

Plate XX.

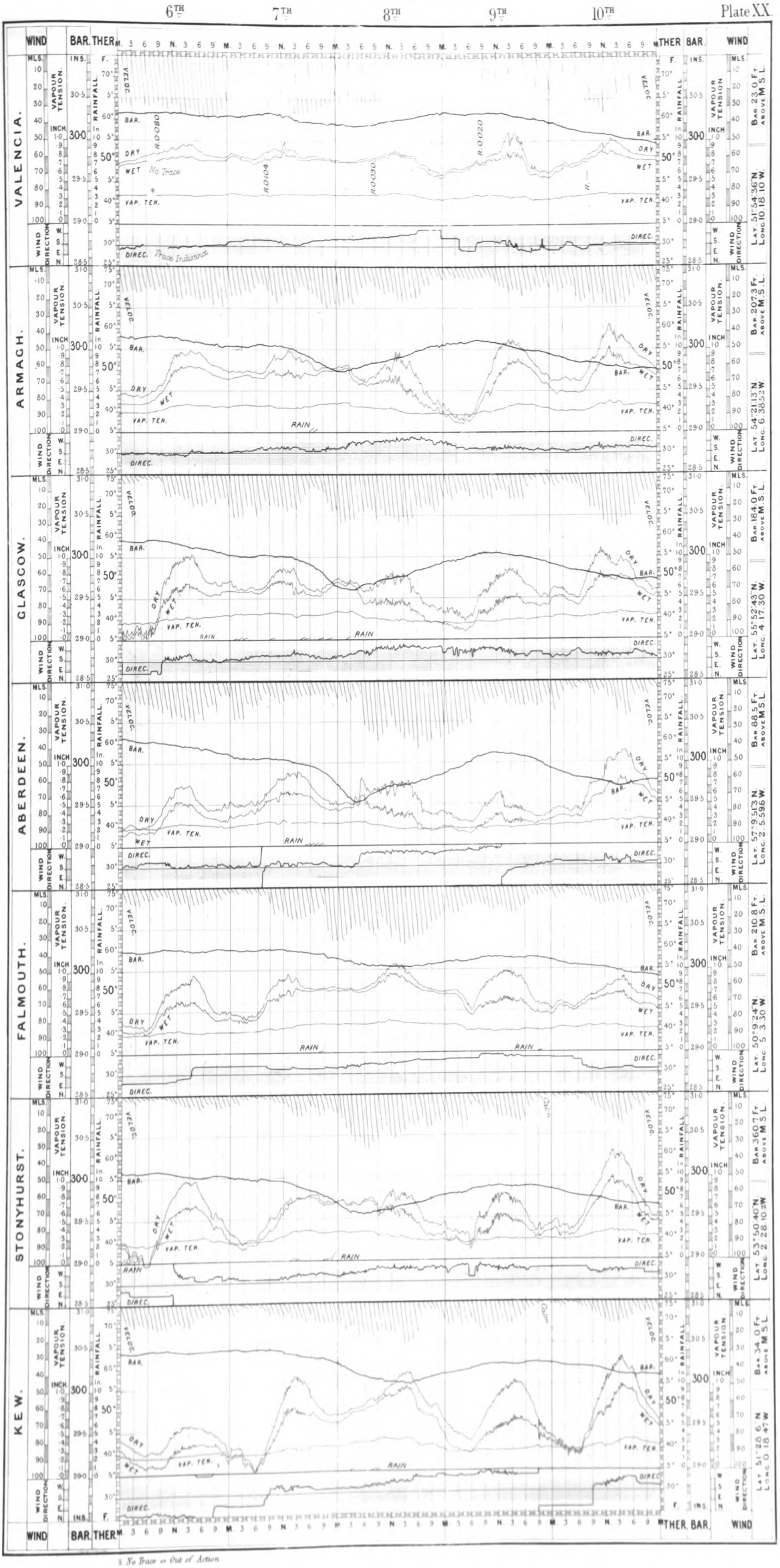
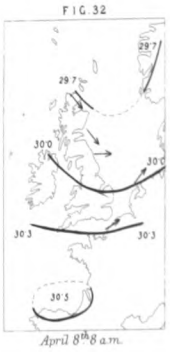
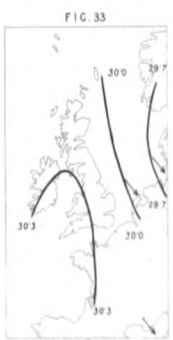



FIG. 32



April 8th 8 a.m.

FIG. 33



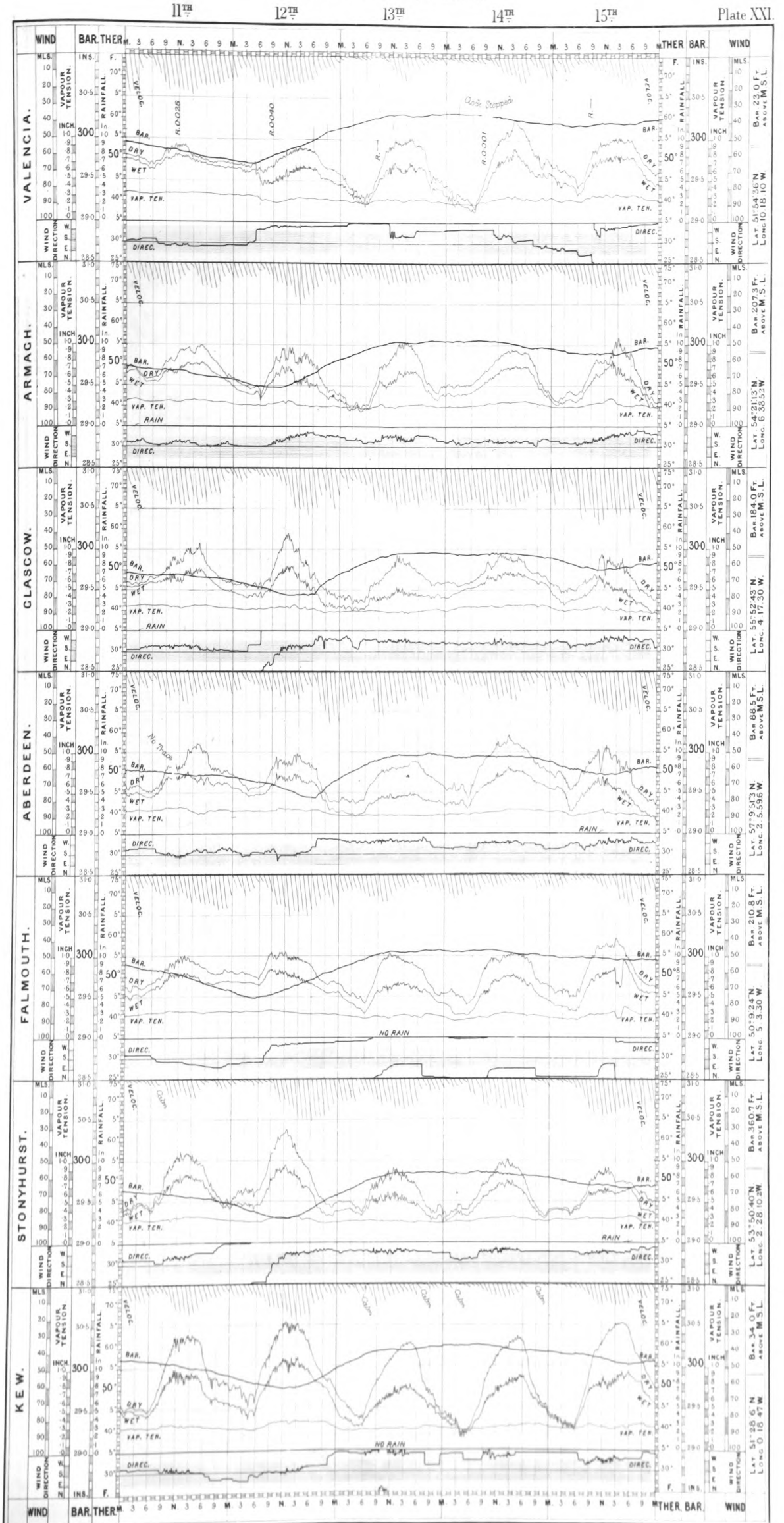
April 9th 8 a.m.

No Trace or Out of Action

# APRIL, 1872.

11TH 12TH 13TH 14TH 15TH

Plate XXI.




* No Trace or Out of Action.

# APRIL, 1872.

Plate XXII.

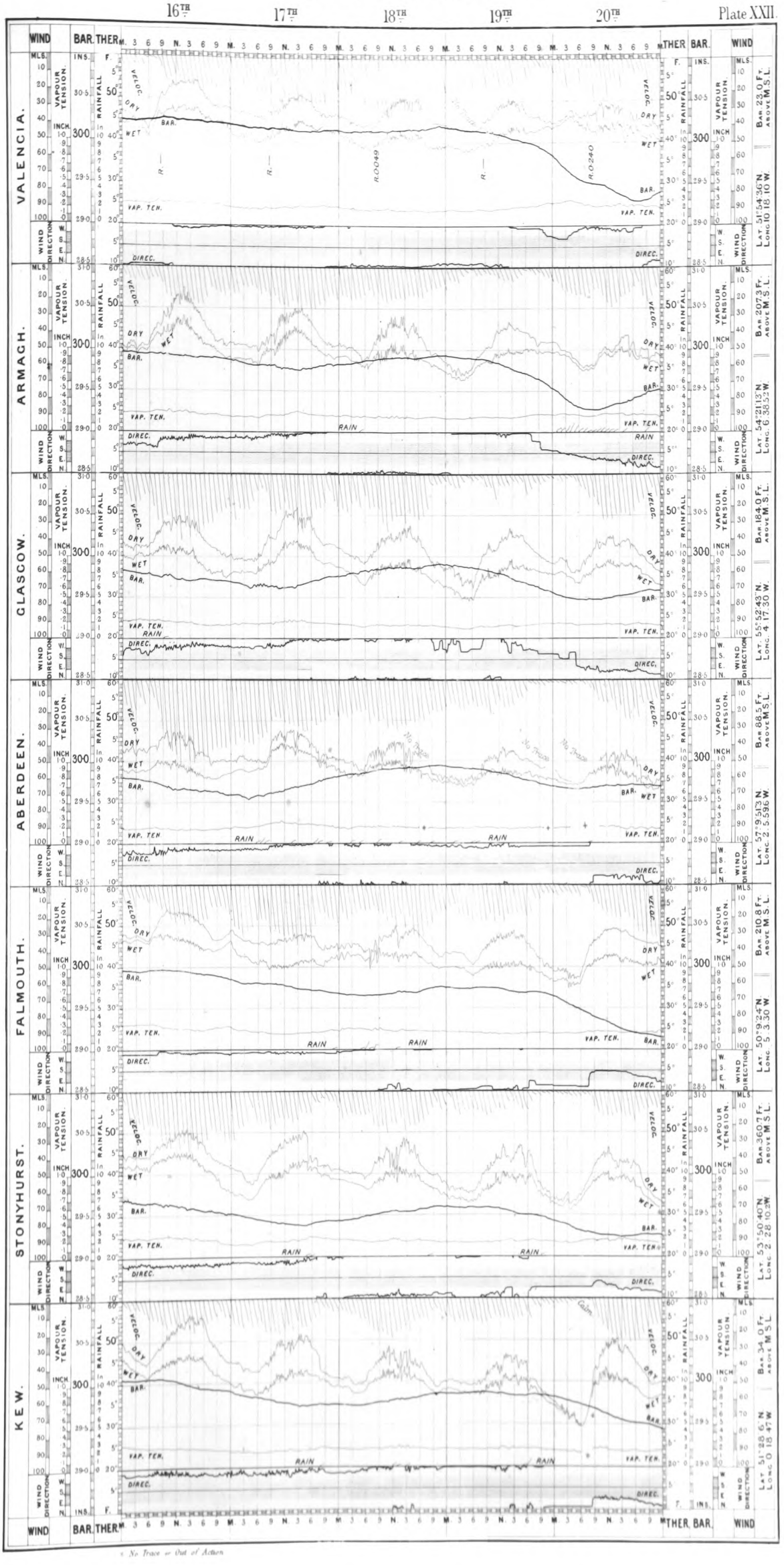
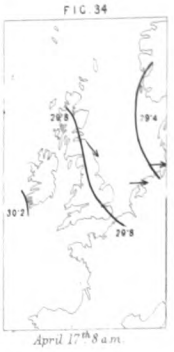
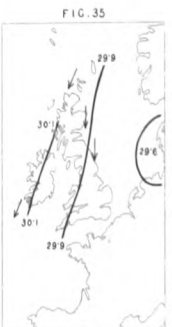



FIG. 34



April 17th 8 a.m.

FIG. 35



April 18th 8 a.m.

FIG. 36

April 20th 6 p.m.

* No Trace or Out of Action

# APRIL, 1872.

21ST 22ND 23RD 24TH 25TH Plate XXIII.

VALENCIA. Bar. 23.0 Ft. above M.S.L. Lat. 51°54'36"N Long. 10 18 10 W.

ARMAGH. Bar. 207.3 Ft. above M.S.L. Lat. 54°21'13"N. Long. 6.38.53 W.

GLASCOW. Bar. 184.0 Ft. above M.S.L. Lat. 55°52'43"N. Long. 4.17.30 W.

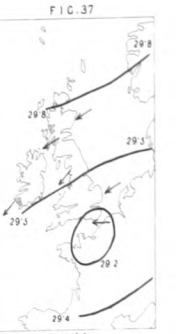
ABERDEEN. Bar. 88.5 Ft. above M.S.L. Lat. 57°9.51'3 N. Long. 2.5.596 W.

FALMOUTH. Bar. 210.8 Ft. above M.S.L. Lat. 50°9'24"N. Long. 5.3.30 W.

STONYHURST. Bar. 360.7 Ft. above M.S.L. Lat. 53°50'40"N. Long. 2.28.10.2 W.

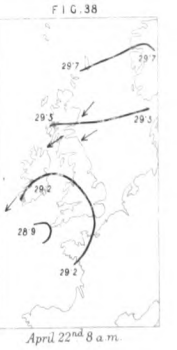
KEW. Bar. 34.0 Ft. above M.S.L. Lat. 51°28.6 N. Long. 0.18.47 W.

FIG. 37



April 21st 8 a.m.

FIG. 38



April 22nd 8 a.m.

FIG. 39

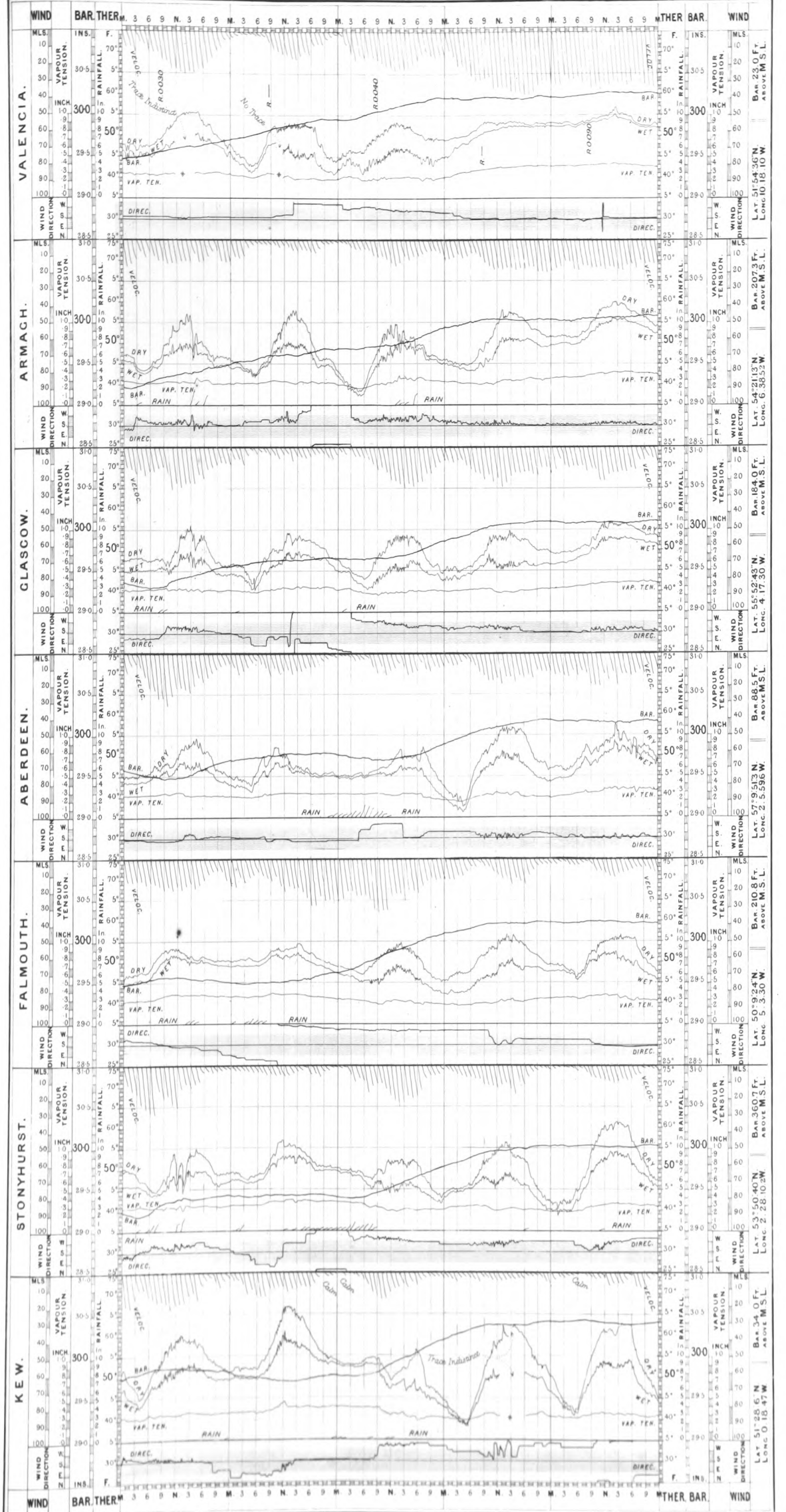
April 23rd 8 a.m.

* No Trace or Out of Action

# APRIL, 1872.

26TH 27TH 28TH 29TH 30TH

Plate XXIV.




* No Trace or Out of Action

# MAY, 1872.

Plate XXV.

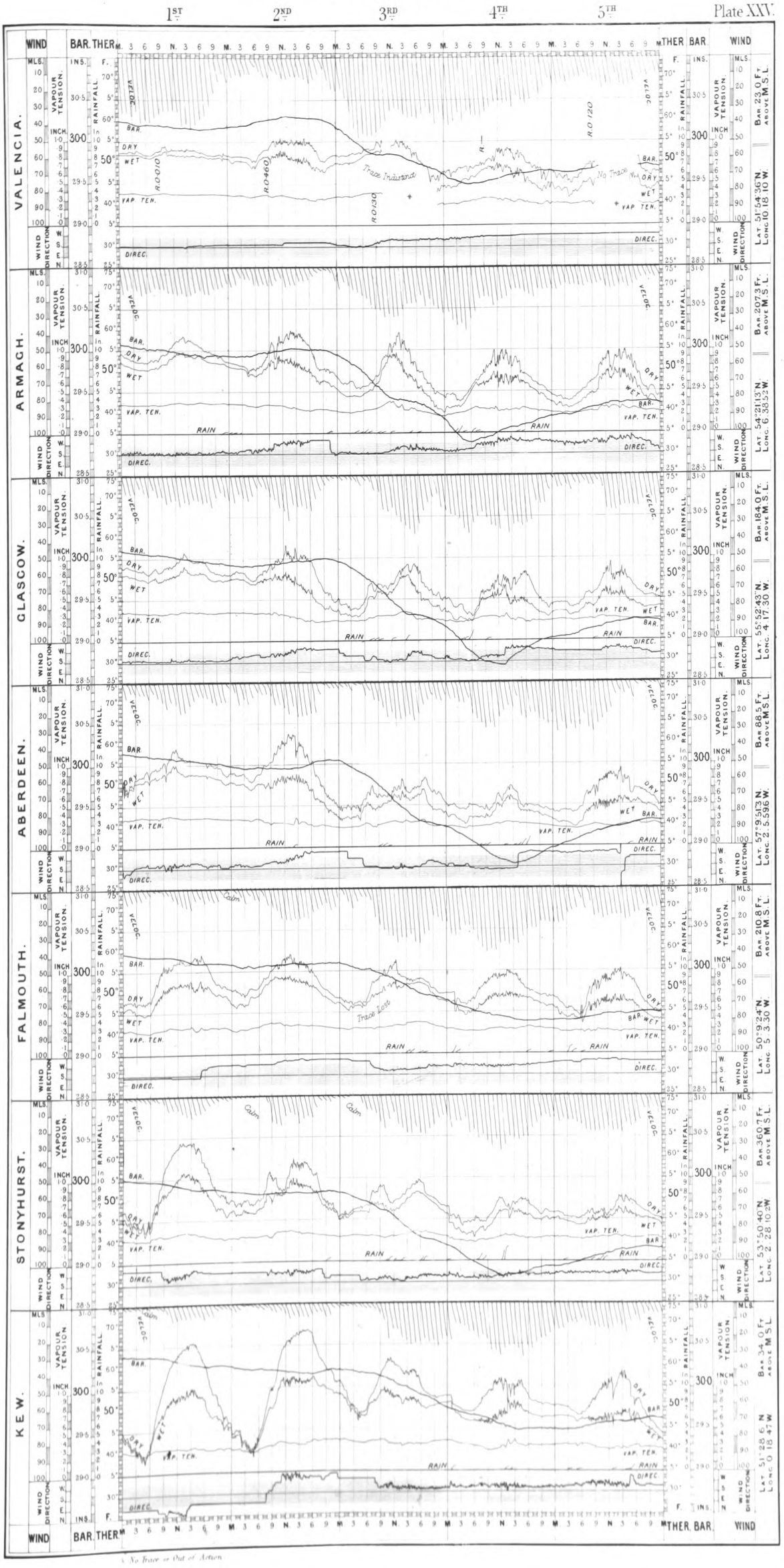
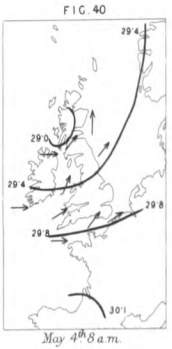



FIG. 40



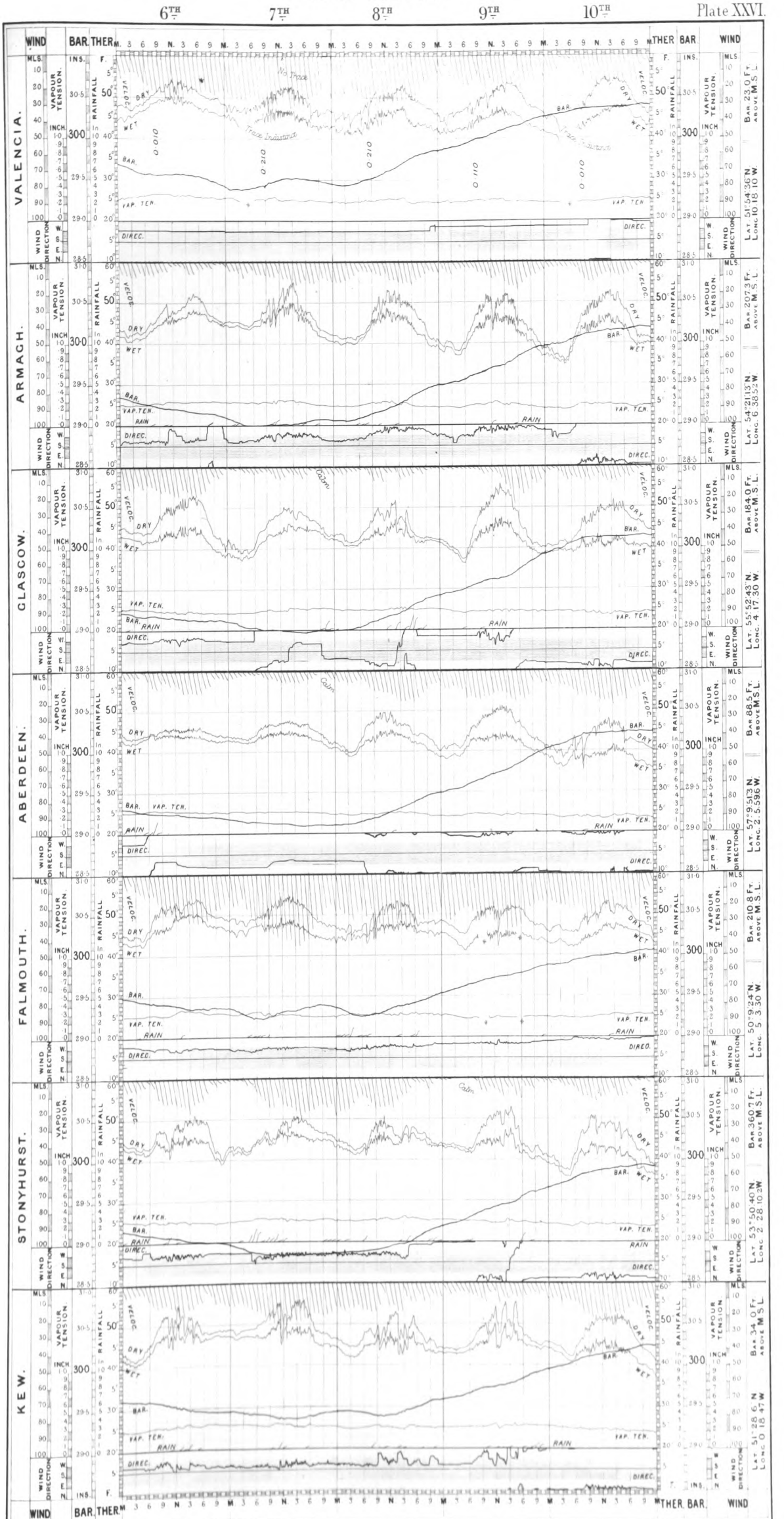

May 4th 8 a.m.

No Trace or Out of Action

# M A Y, 1872.

6TH 7TH 8TH 9TH 10TH

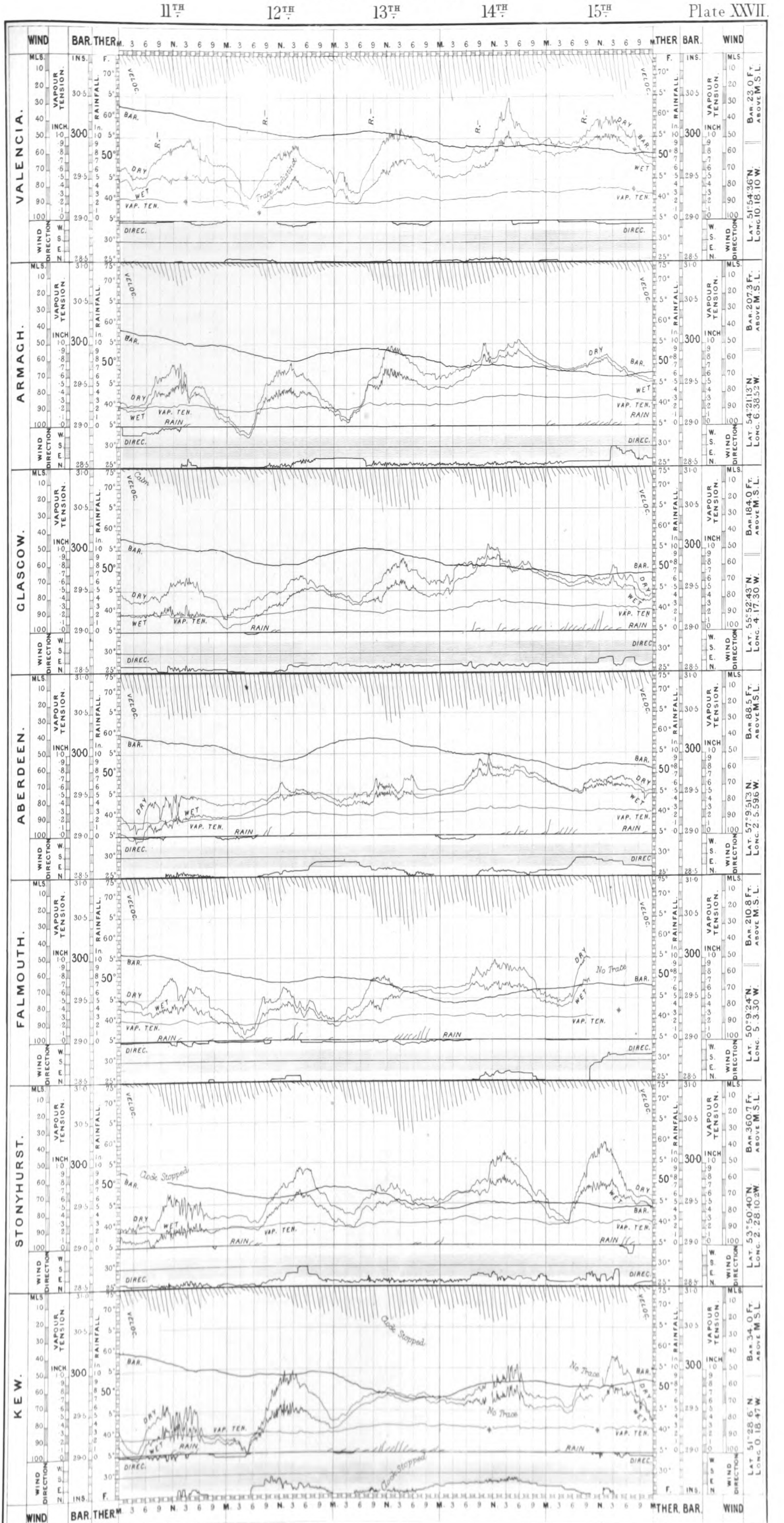
Plate XXVI.




* No Trace or Out of Action

# M A Y, 1872.

11TH 12TH 13TH 14TH 15TH Plate XXVII.

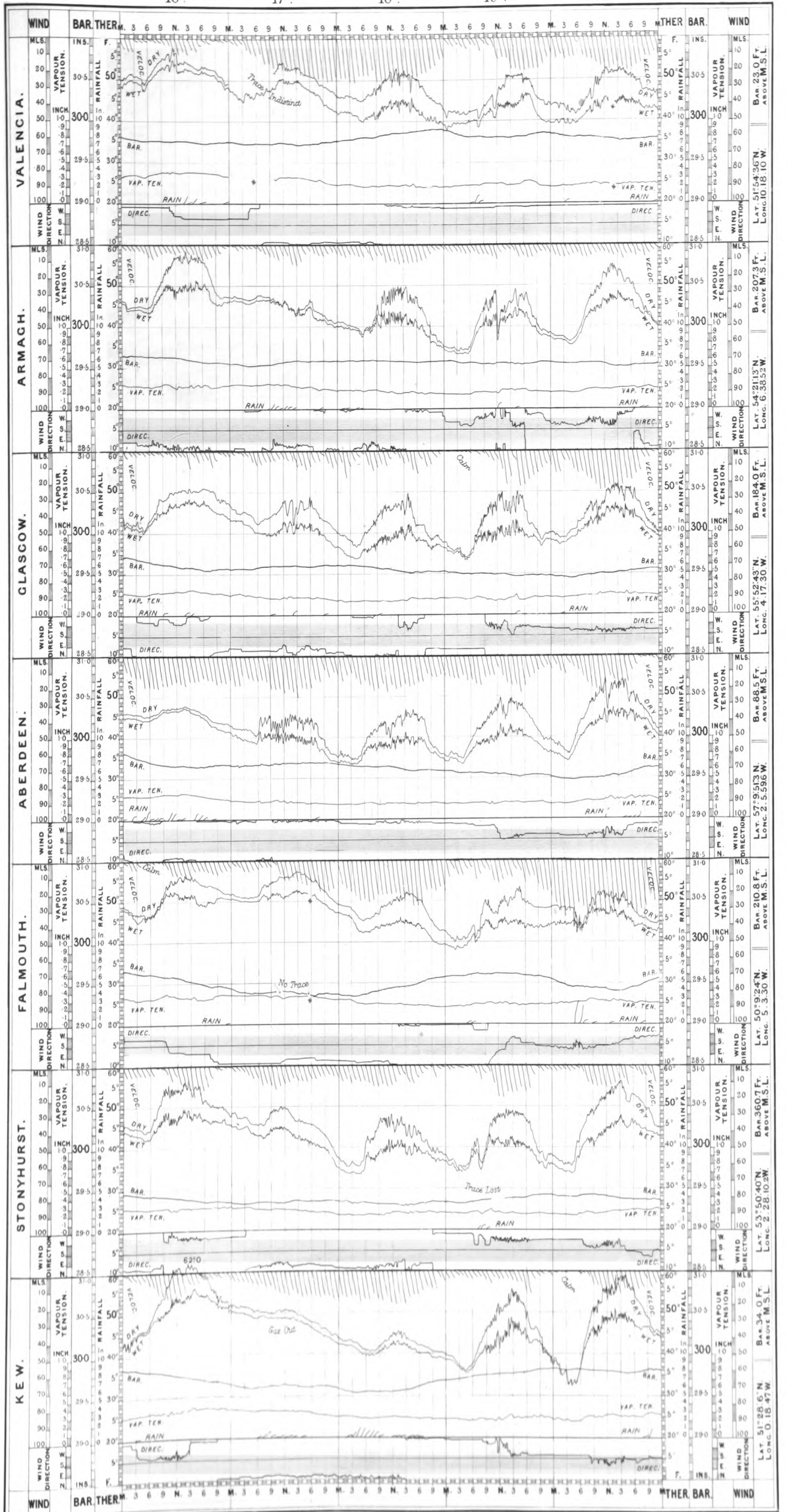



* No Trace or Out of Action

# MAY, — 1872.

Plate XXVIII.

16TH 17TH 18TH 19TH 20TH

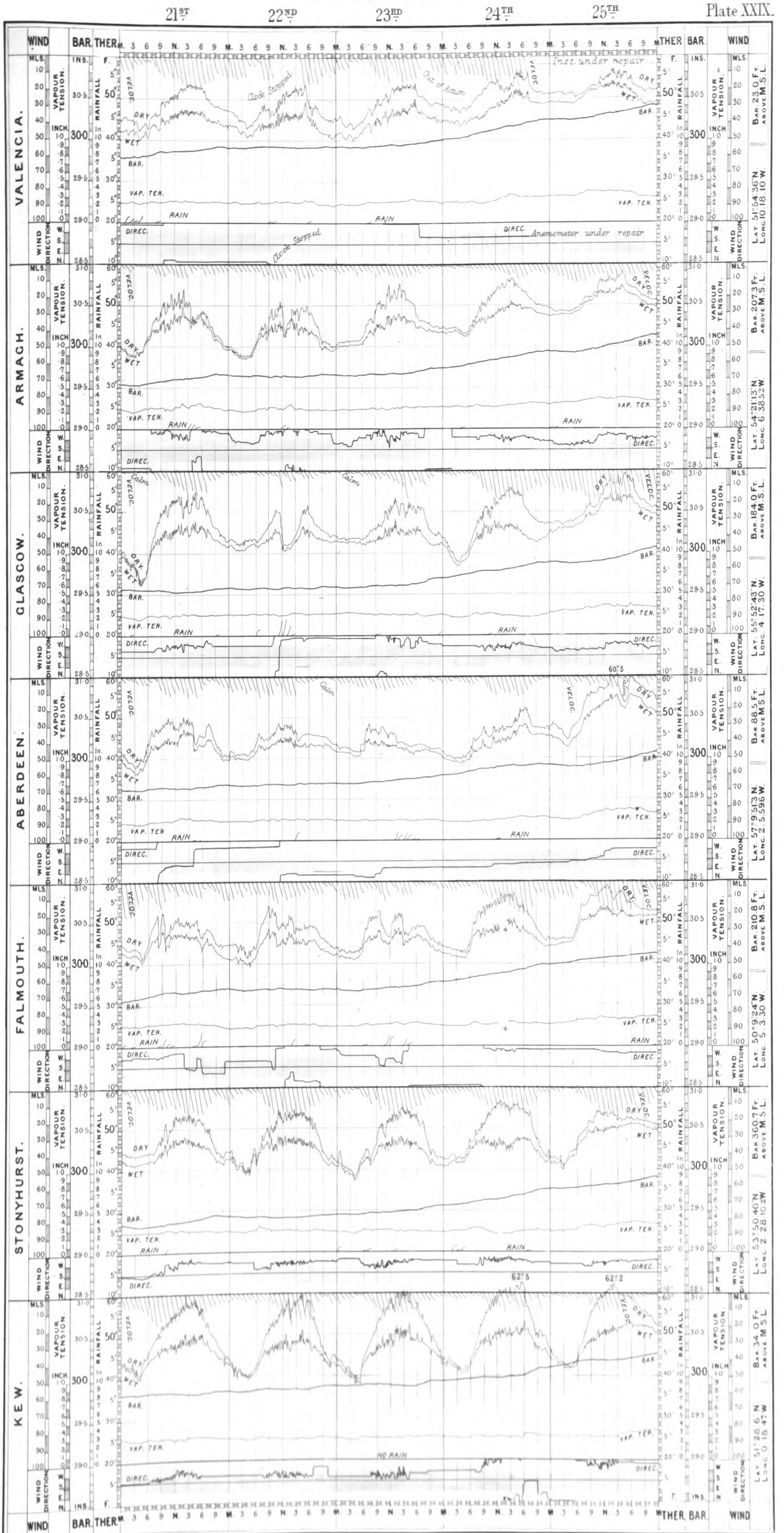



* No Trace or Out of Action

# MAY, 1872.

Plate XXIX.

21ST 22ND 23RD 24TH 25TH




* No Trace or Out of Action

# MAY, 1872.

Plate XXX.

26TH 27TH 28TH 29TH 30TH

## VALENCIA.

Inst. under repair

Anemometer under repair

DIREC. Out of Action

Bar. 23.0 Ft. above M.S.L.

Lat. 51° 54' 36" N.
Long. 10° 18' 10" W.

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.

Lat. 54° 21' 13" N.
Long. 6° 38' 32" W.

## GLASGOW.

Bar. 184.0 Ft. above M.S.L.

Lat. 55° 52' 48" N.
Long. 4° 17' 30" W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.

Lat. 57° 9' 51" N.
Long. 2° 5' 596" W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.

Lat. 50° 9' 24" N.
Long. 5° 3' 30" W.

## STONYHURST.

Bar. 360.7 Ft. above M.S.L.

Lat. 53° 50' 40" N.
Long. 2° 28' 10" W.

## KEW.

Bar. 34.0 Ft. above M.S.L.

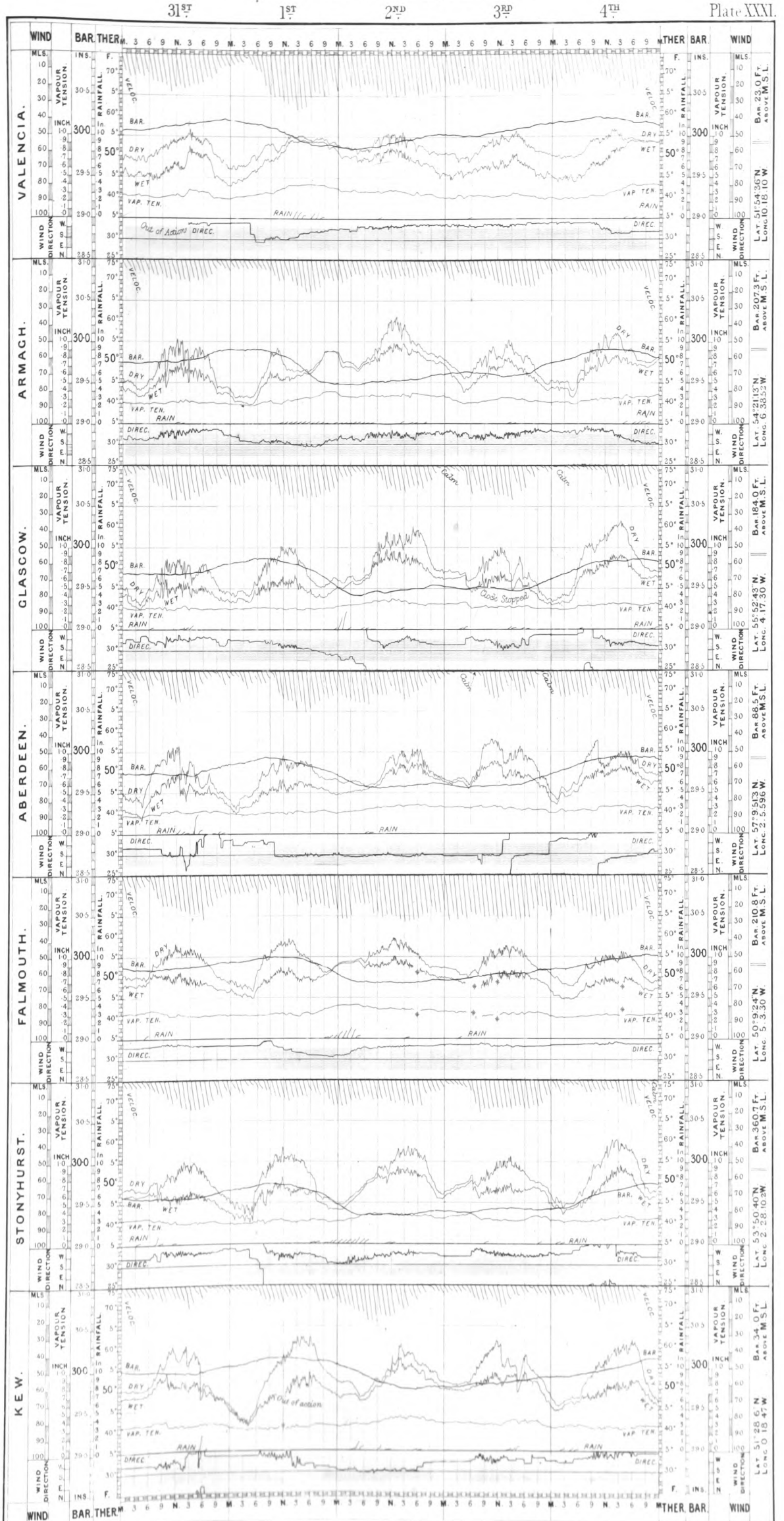
Lat. 51° 28' 6" N.
Long. 0° 18' 47" W.

* No Trace or Out of Action.

# MAY & JUNE, 1872.

Plate XXXI.

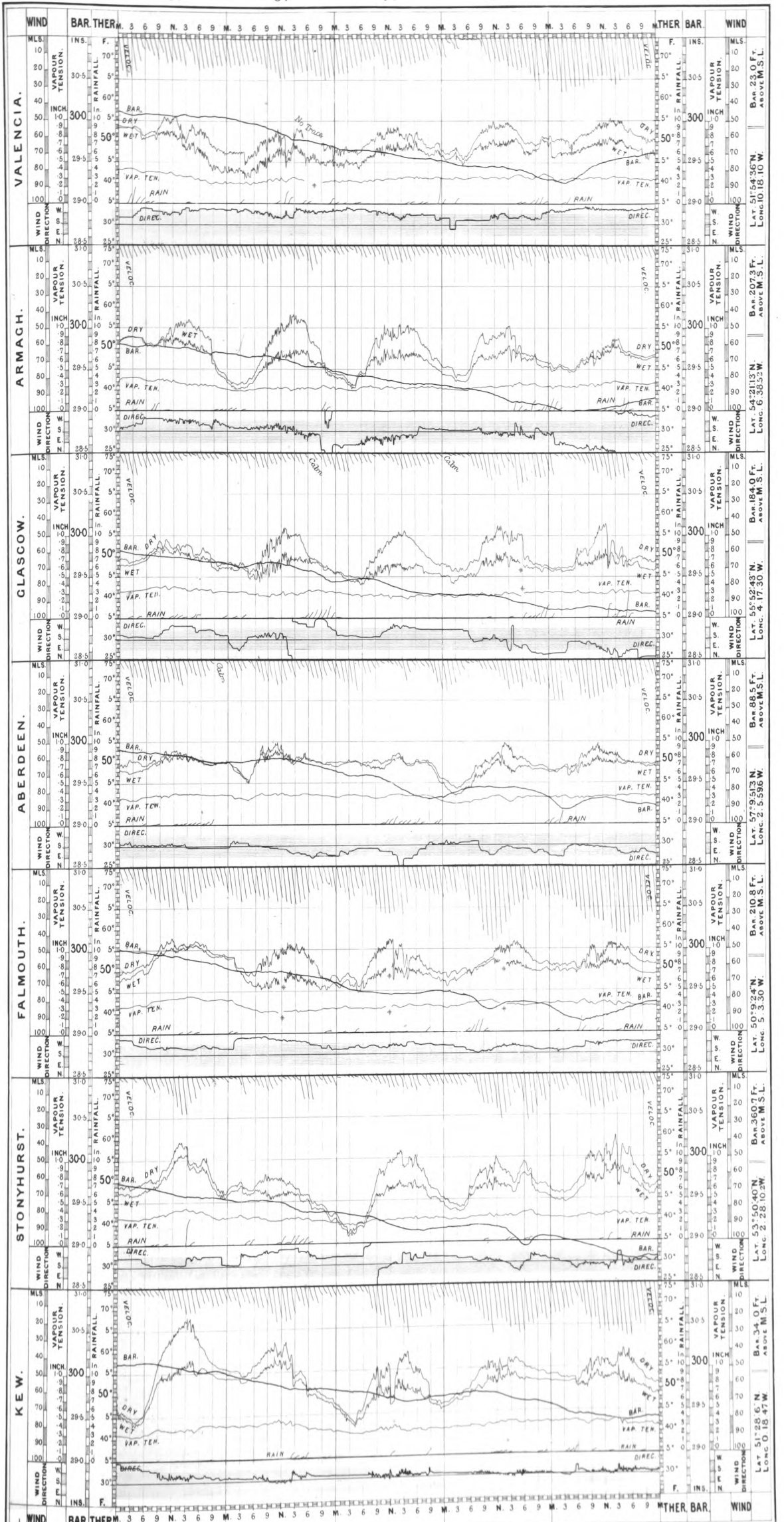
31ST. 1ST. 2ND. 3RD. 4TH.




* No Trace or Out of Action

# JUNE, 1872.

5TH 6TH 7TH 8TH 9TH Plate XXXII.

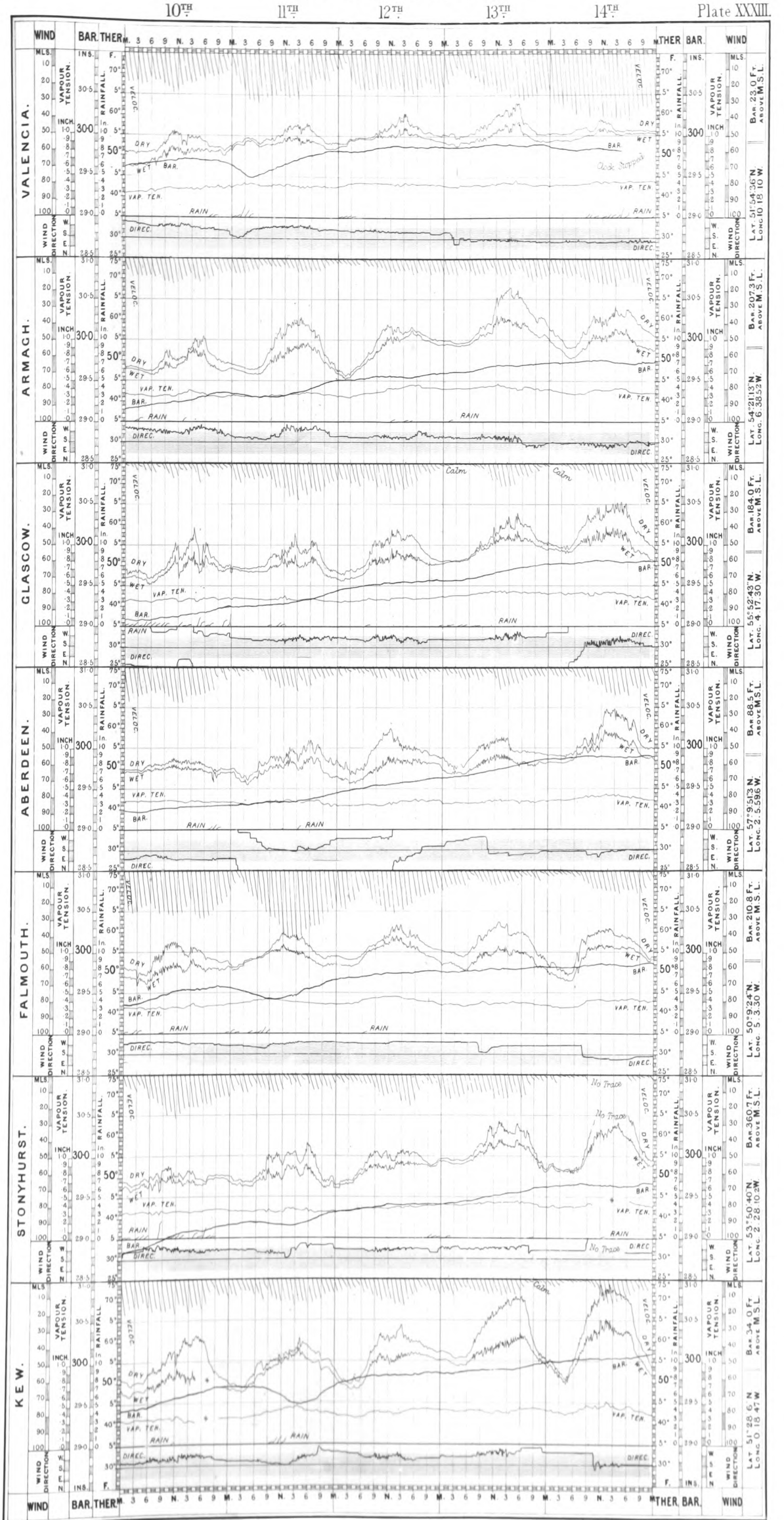



* No Trace or Out of Action.

# JUNE, 1872.

10TH 11TH 12TH 13TH 14TH

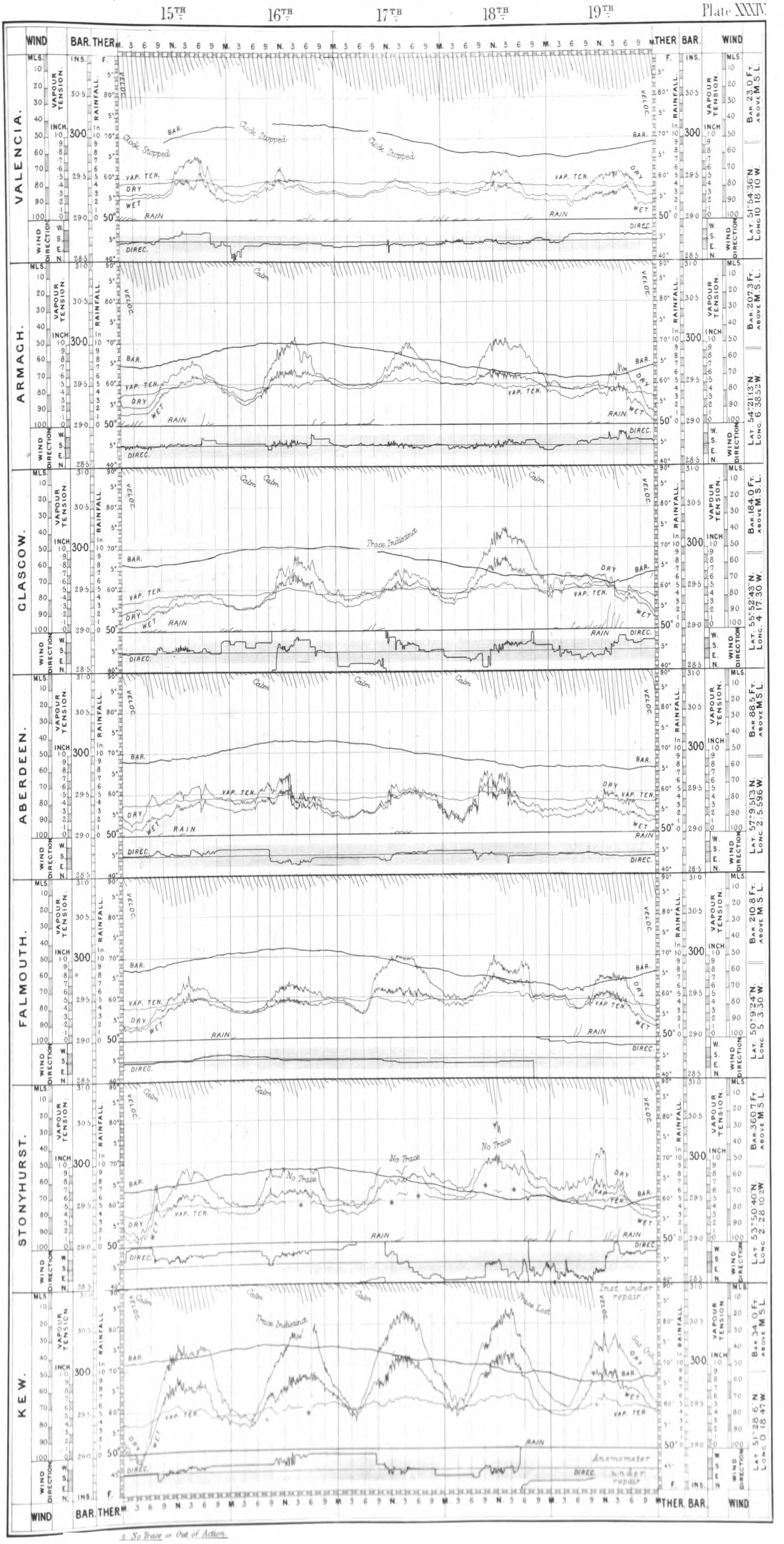
Plate XXXIII.




* No Trace or Out of Action.

# JUNE, 1872.

15TH | 16TH | 17TH | 18TH | 19TH | Plate XXXIV.

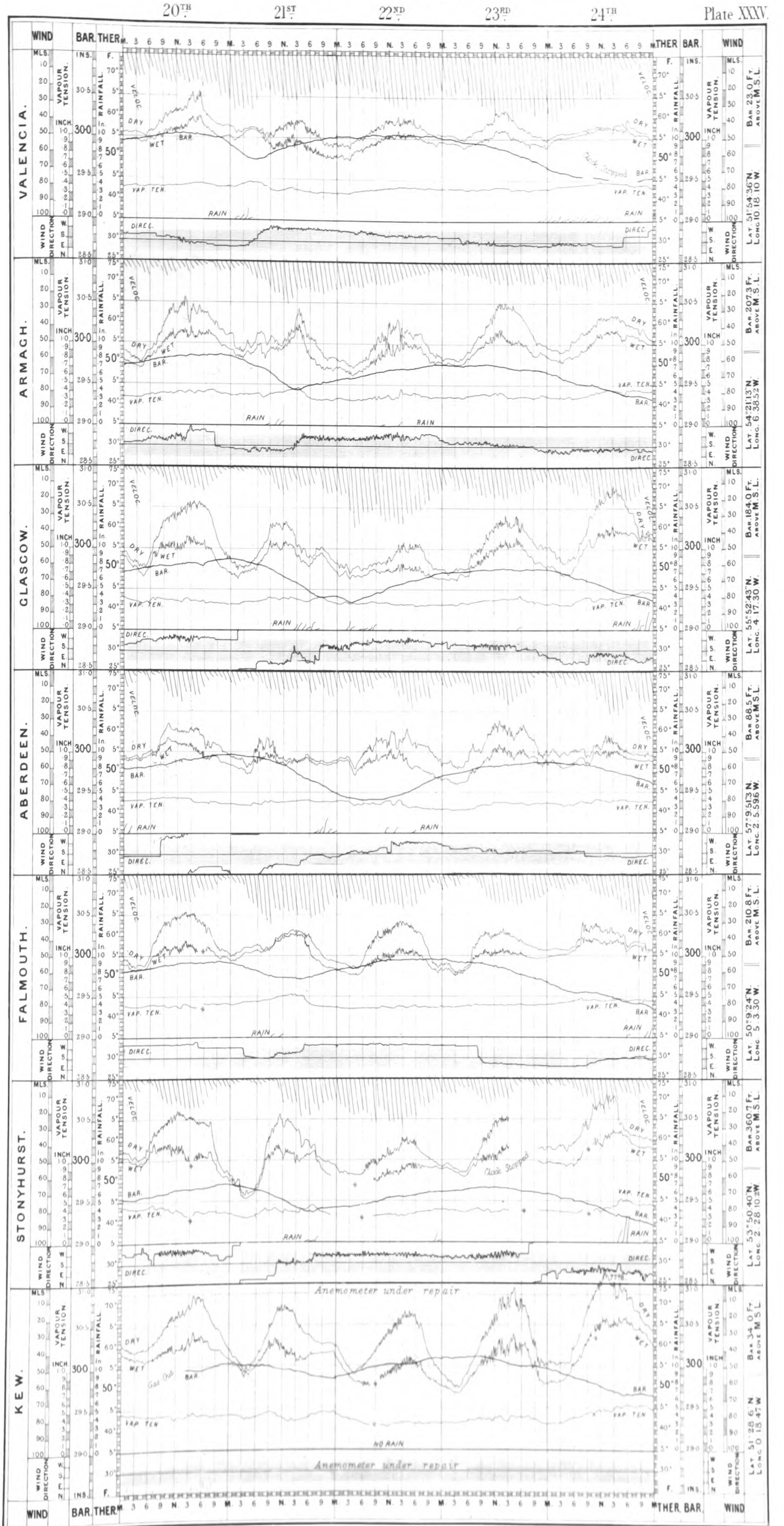



* No Trace or Out of Action.

# JUNE, 1872.

20TH 21ST 22ND 23RD 24TH

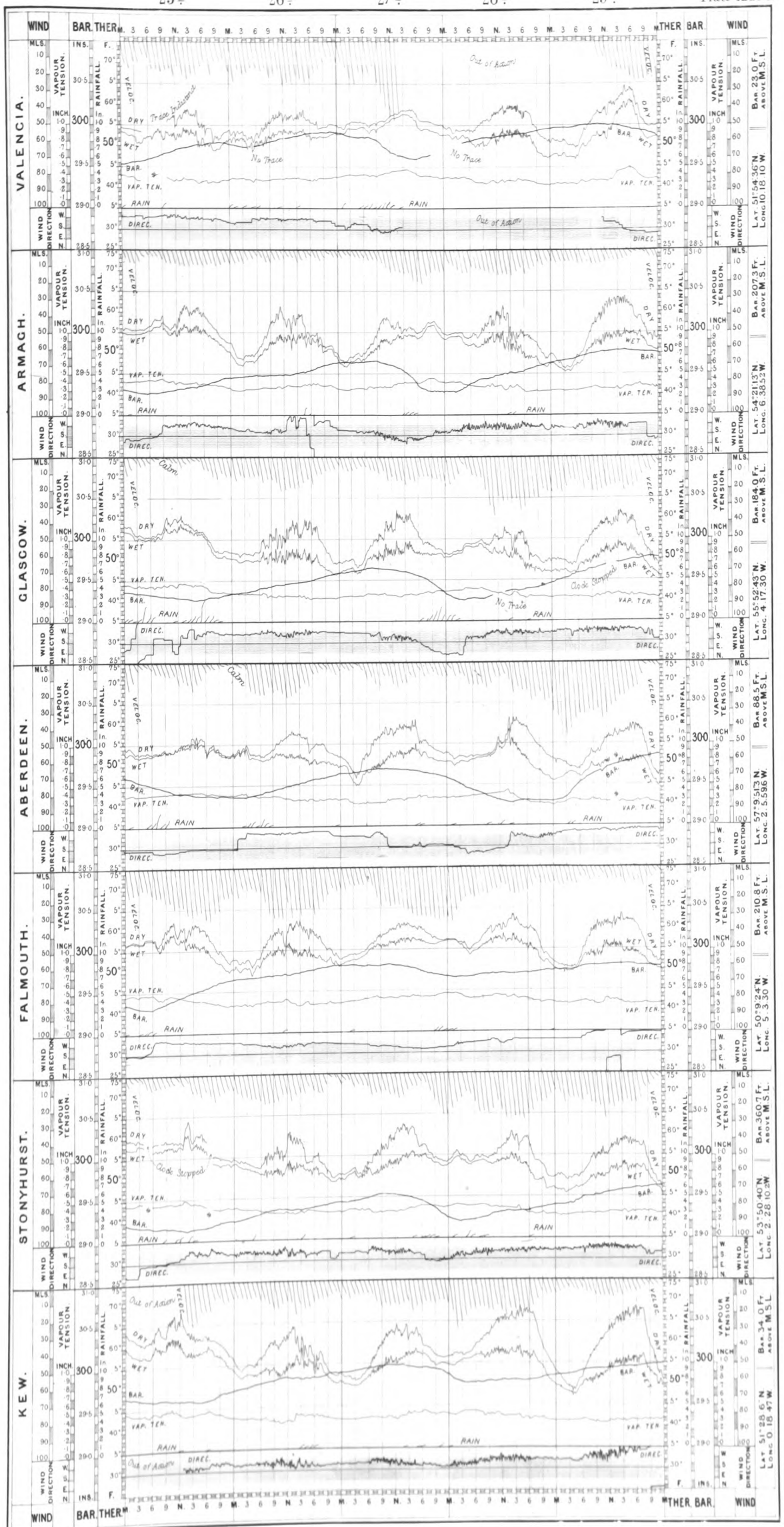
Plate XXV.




* No Trace or Out of Action

# JUNE, — 1872.

25TH. 26TH. 27TH. 28TH. 29TH. Plate XXXVI.




* No Trace or Out of Action

# JUNE, JULY. 1872.

30TH | 1ST | 2ND | 3RD | 4TH

Plate XXXVII.

## VALENCIA.

Bar. 23.0 Ft. above M.S.L.
Lat. 51°54'36"N. Long. 10 18 10 W

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.
Lat. 54°21'13"N. Long. 6°38'52"W.

## GLASCOW.

Bar. 184.0 Ft. above M.S.L.
Lat. 55°52'43"N. Long. 4°17'30"W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.
Lat. 57°9'51"3 N. Long. 2°5'596 W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.
Lat. 50°9'24"N. Long. 5°3'30"W.

## STONYHURST.

Bar. 360.7 Ft. above M.S.L.
Lat. 53°50'40"N. Long. 2°28'10.2W.

## KEW.

Bar. 34.0 Ft. above M.S.L.
Lat. 51°28'6"N. Long. 0°18'47"W.

WIND | BAR. | THER. | M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 | THER. | BAR. | WIND

MLS. | VAPOUR TENSION. | INCH. | INS. | F. | RAINFALL. | In | WIND DIRECTION | W. S. E. N.

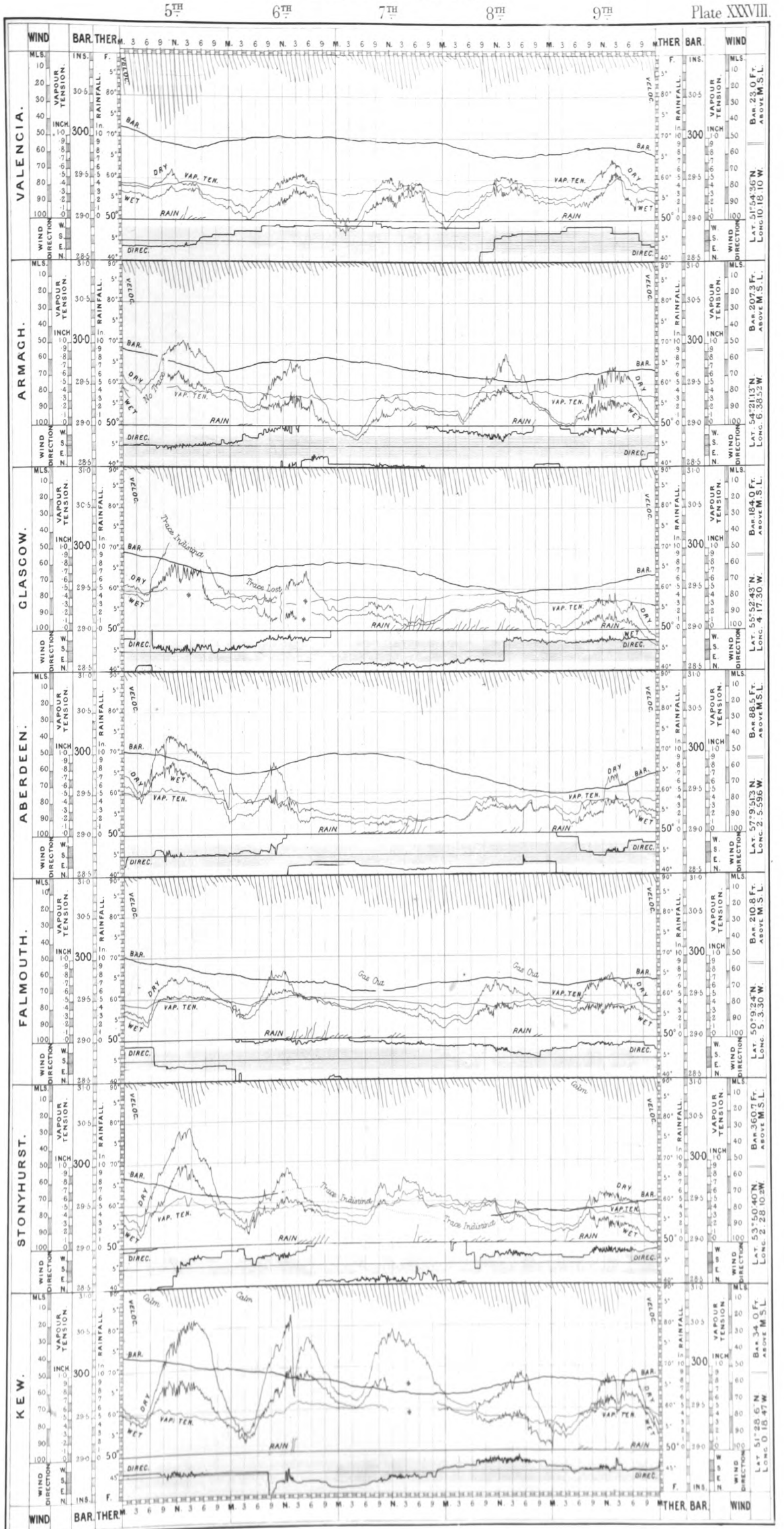
VELOC. | DRY | WET | BAR. | VAP. TEN. | RAIN | DIREC. | Calm | Trace Lost | No Trace | Clock Stopped

* No Trace or Out of Action

# JULY, 1872.

5TH 6TH 7TH 8TH 9TH

Plate XXXVIII.

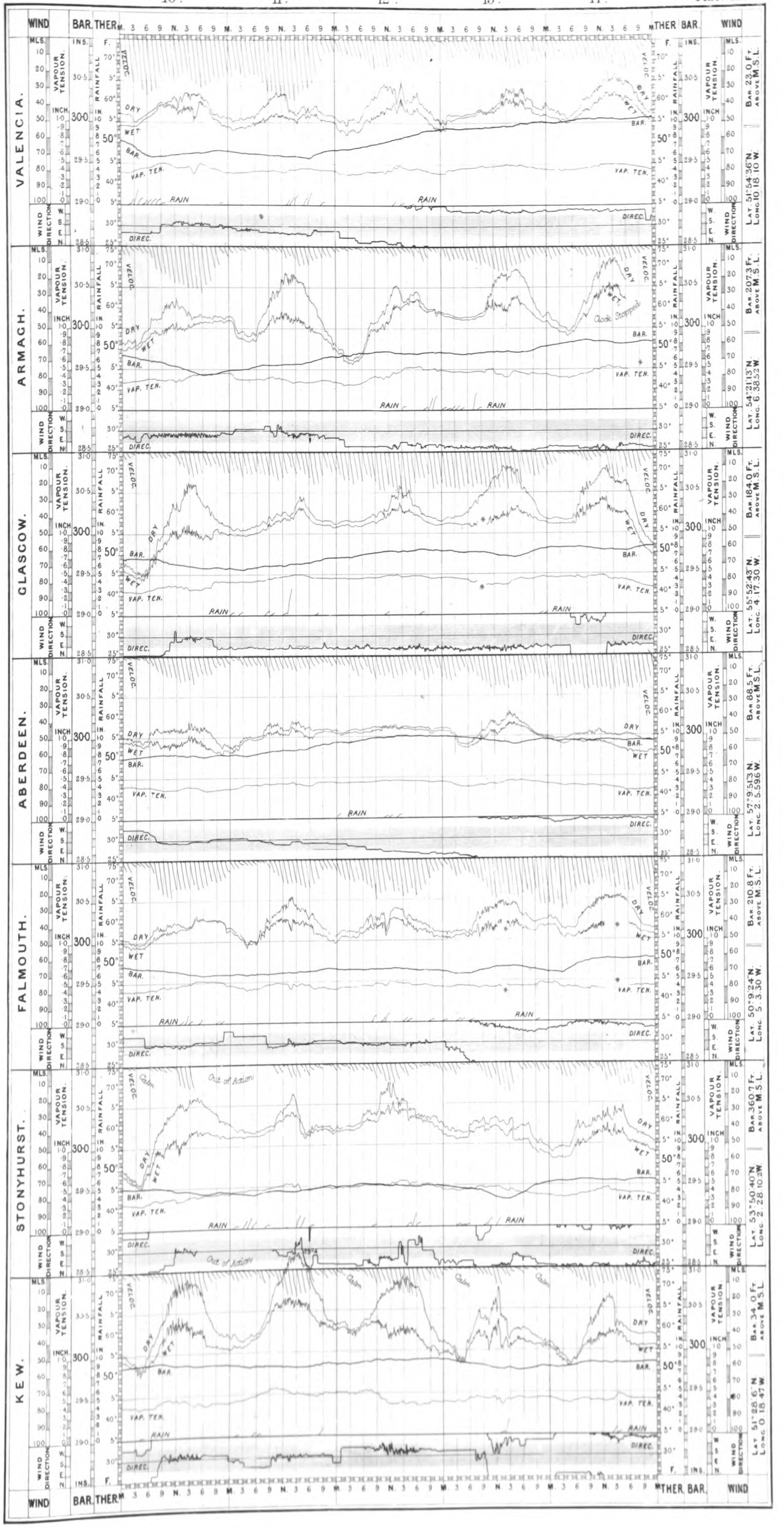



* No Trace or Out of Action.

# JULY, — 1872.

10TH 11TH 12TH 13TH 14TH

Plate XXXIX.



# JULY, — 1872.

Plate XL.

15TH 16TH 17TH 18TH 19TH

## VALENCIA.

Bar. 23.0 Ft. above M.S.L.
Lat. 51°54'36" N.
Long. 10.18.10 W.

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.
Lat. 54°21'13" N.
Long. 6.38.52 W.

## GLASGOW.

Bar. 184.0 Ft. above M.S.L.
Lat. 55°52'43" N.
Long. 4.17.30 W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.
Lat. 57°9.513 N.
Long. 2.5.596 W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.
Lat. 50°9'24" N.
Long. 5.3.30 W.

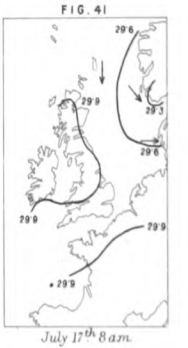
## STONYHURST.

Bar. 360.7 Ft. above M.S.L.
Lat. 53°50'40" N.
Long. 2.28.10.2 W.

## KEW.

Bar. 34.0 Ft. above M.S.L.
Lat. 51°28'6" N.
Long. 0.18'47" W.

FIG. 41

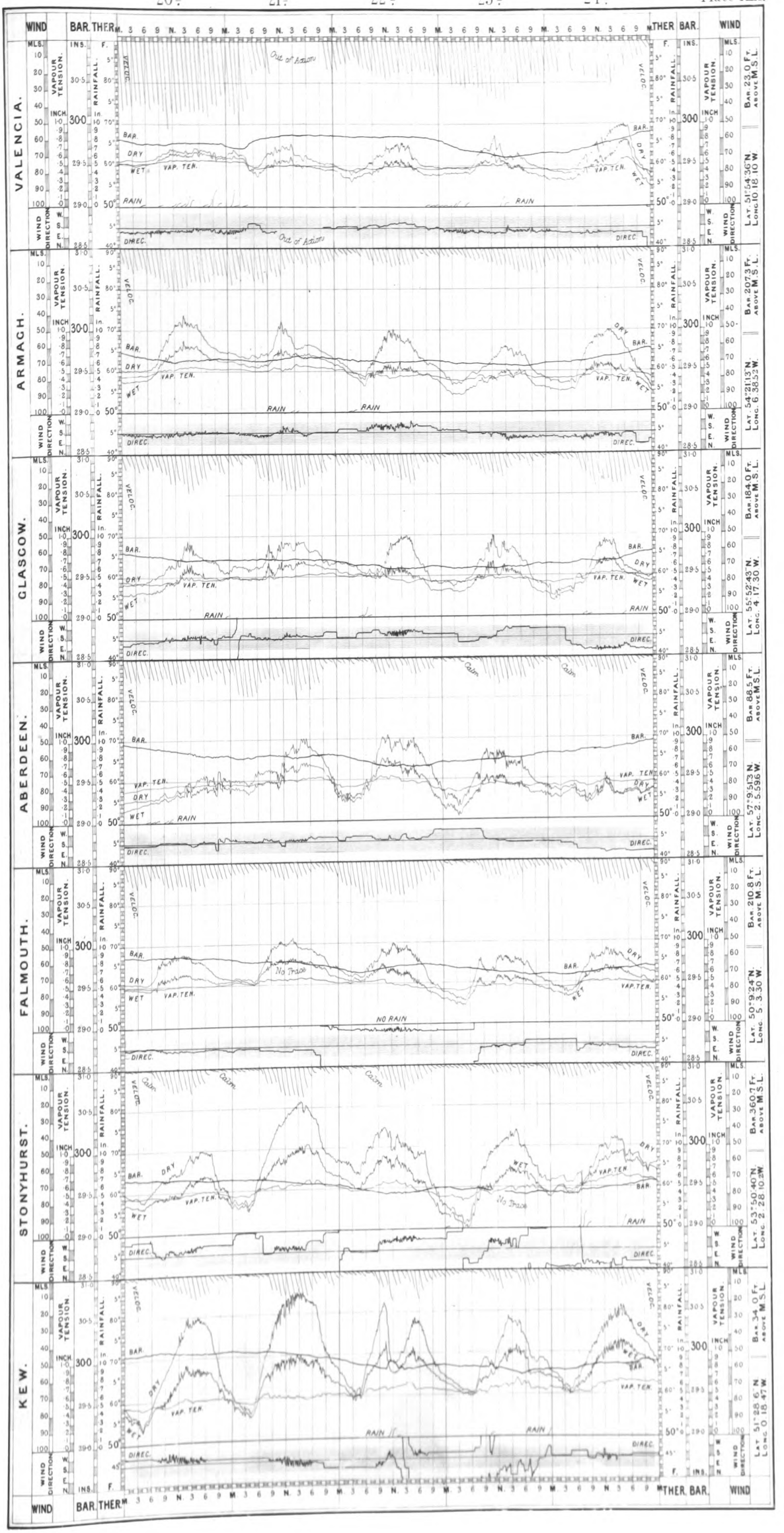



July 17th 8 a.m.

# JULY, — 1872.

20TH 21ST 22ND 23RD 24TH

Plate XLI.



# JULY, 1872.

25TH 26TH 27TH 28TH 29TH

Plate XLII.

## VALENCIA.

Bar. 23.0 Ft. above M.S.L.
Lat. 51°54'36" N.
Long. 10° 18' 10" W.

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.
Lat. 54°21'13" N.
Long. 6° 38'3" W.

## GLASCOW.

Bar. 184.0 Ft. above M.S.L.
Lat. 55°52'48" N.
Long. 4° 17'30" W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.
Lat. 57°9'57" N.
Long. 2° 5'39" W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.
Lat. 50°9'24" N.
Long. 5° 3'30" W.

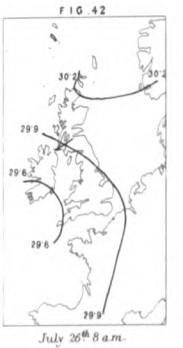
## STONYHURST.

Bar. 360.7 Ft. above M.S.L.
Lat. 53°50'40" N.
Long. 2° 28'10" W.

## KEW.

Bar. 34.0 Ft. above M.S.L.
Lat. 51° 28'6" N.
Long. 0° 18'47" W.

FIG. 42



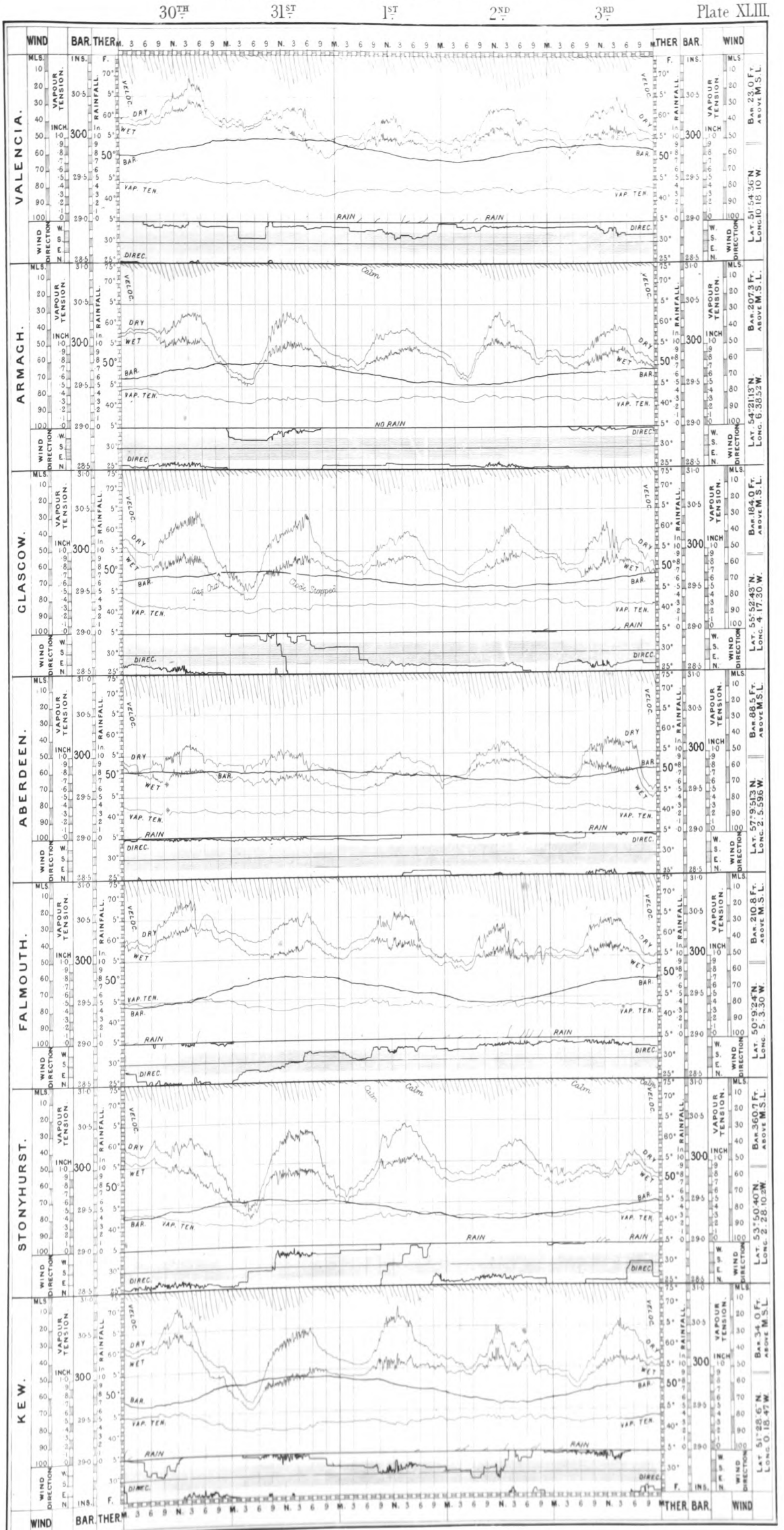

July 26th 8 a.m.

* No Trace or Out of Action.

# JULY & AUGUST, 1872.

30TH | 31ST | 1ST | 2ND | 3RD

Plate XLIII.

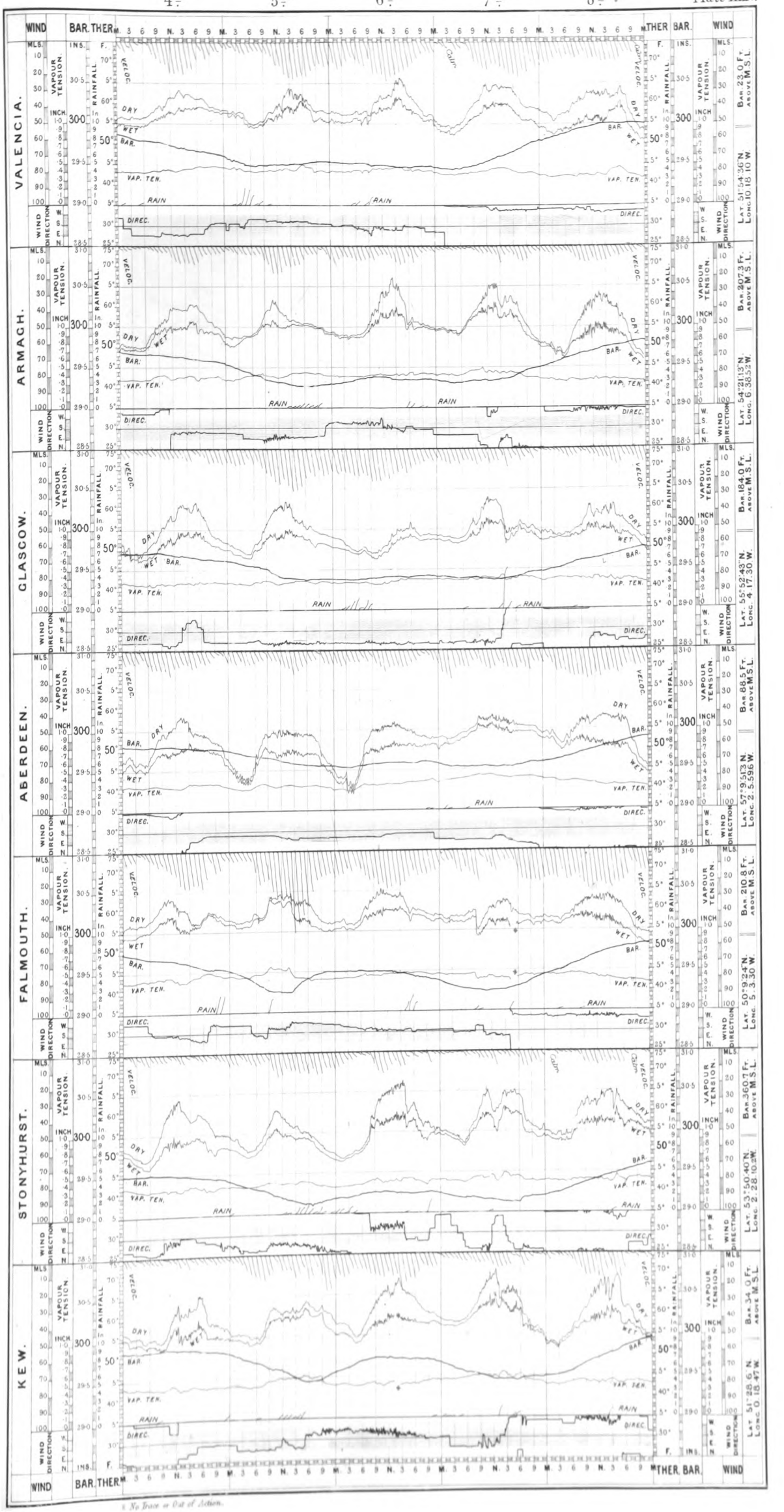



* No Trace or Out of Action.

# AUGUST, 1872.

4TH. 5TH. 6TH. 7TH. 8TH.

Plate XLIV.




* No Trace or Out of Action.

# AUGUST, 1872.

9TH 10TH 11TH 12TH 13TH Plate XLV.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

## VALENCIA.

MLS. INS. F. VELOC. VAPOUR TENSION. RAINFALL. BAR. DRY WET VAP. TEN. RAIN DIREC. WIND DIRECTION W. S. E. N.

Calm

Bar. 23.0 Ft. above M.S.L.

Lat. 51° 54' 36" N. Long. 10. 18. 10 W.

## ARMAGH.

Clock Stopped

Bar. 207.3 Ft. above M.S.L.

Lat. 54° 21' 13" N. Long. 6. 38. 52 W.

## GLASGOW.

Bar. 184.0 Ft. above M.S.L.

Lat. 55° 52' 43" N. Long. 4. 17. 30 W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.

Lat. 57° 9' 51" N. Long. 2. 5. 596 W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.

Lat. 50° 9' 24" N. Long. 5. 3. 30 W.

## STONYHURST.

Gas Out

Bar. 360.7 Ft. above M.S.L.

Lat. 53° 50' 40" N. Long. 2. 28. 10 W.

## KEW.

Calm

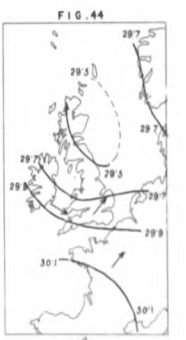
Bar. 34.0 Ft. above M.S.L.

Lat. 51° 28. 6 N. Long. 0. 18. 47 W.

FIG. 43

*Aug. 10th 8 a.m.*

FIG. 44

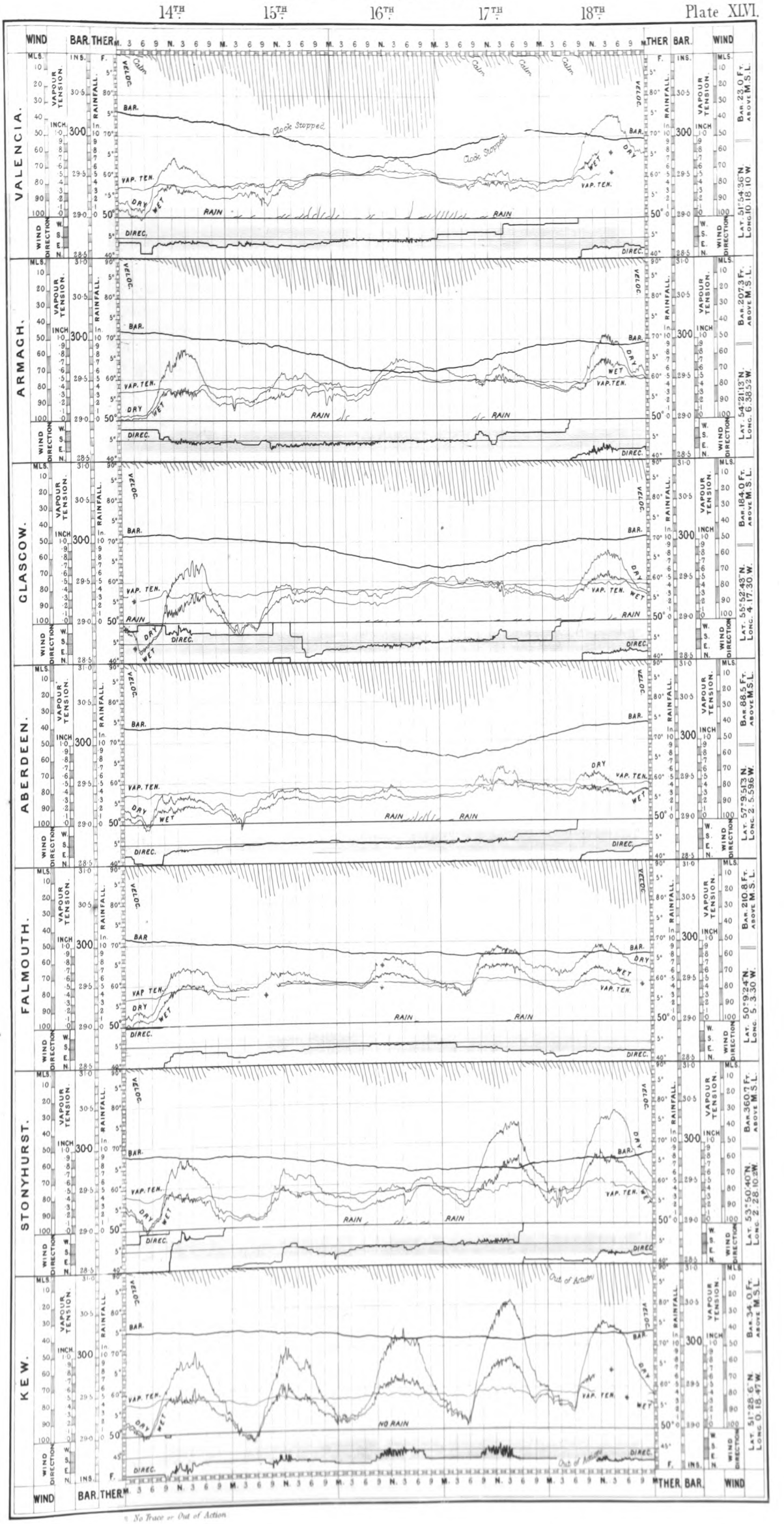



*Aug. 11th 8 a.m.*

* No Trace or Out of Action

# AUGUST, 1872.

14TH 15TH 16TH 17TH 18TH Plate XLVI.

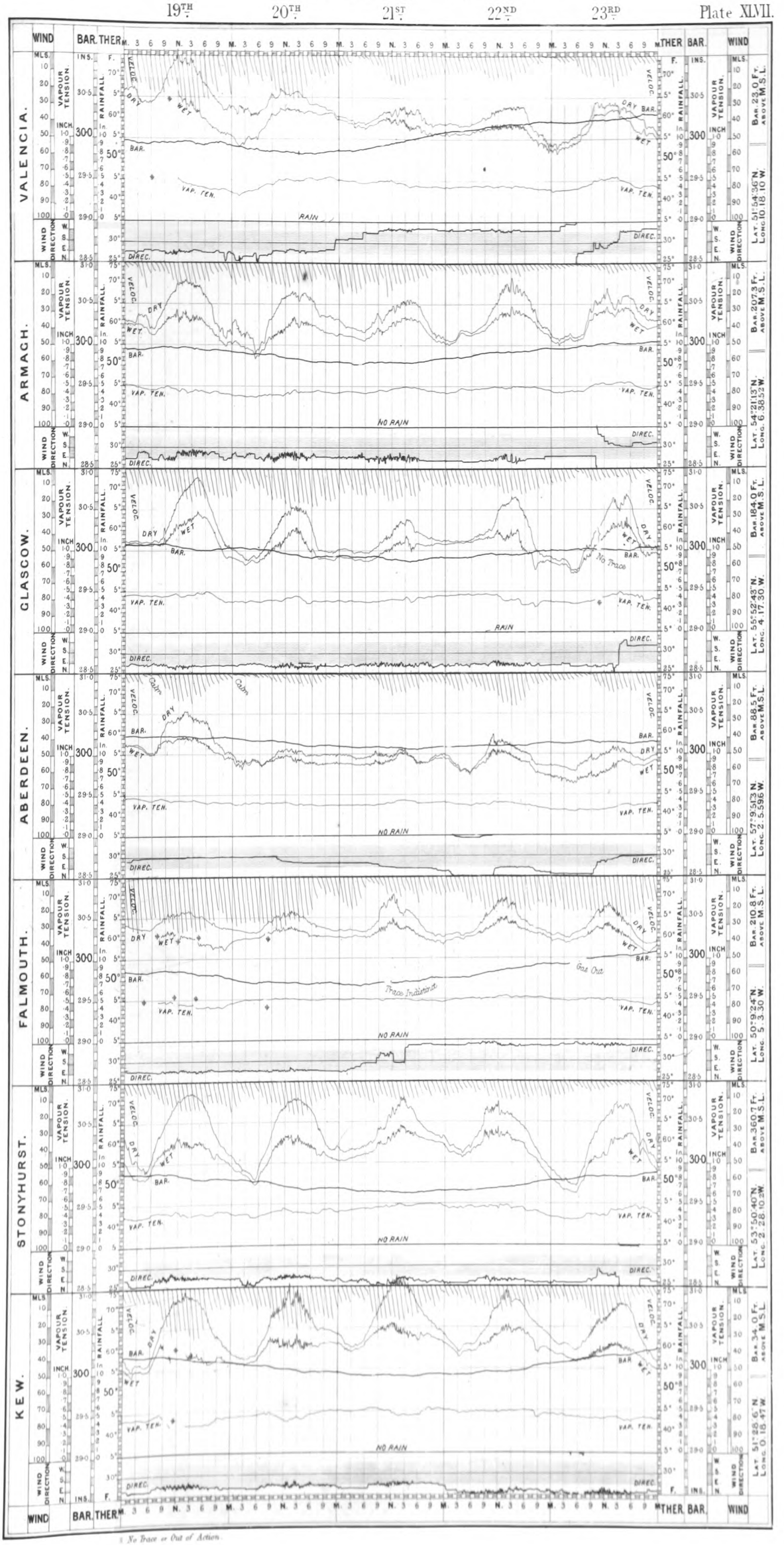



* No Trace or Out of Action.

# AUGUST, 1872.

19TH 20TH 21ST 22ND 23RD

Plate XLVII.

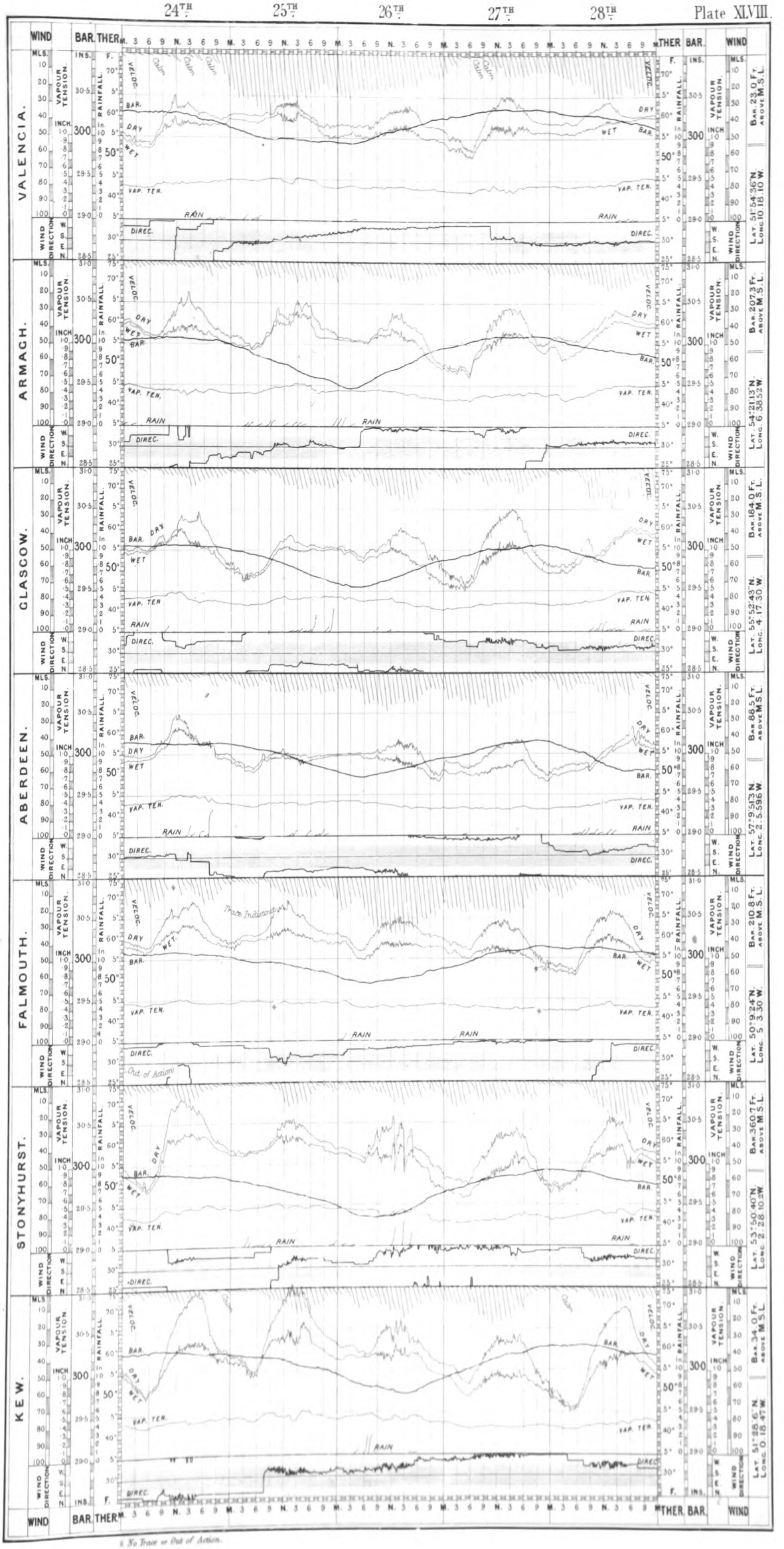



1 No Trace or Out of Action.

# AUGUST, 1872.

24TH 25TH 26TH 27TH 28TH

Plate XLVIII.

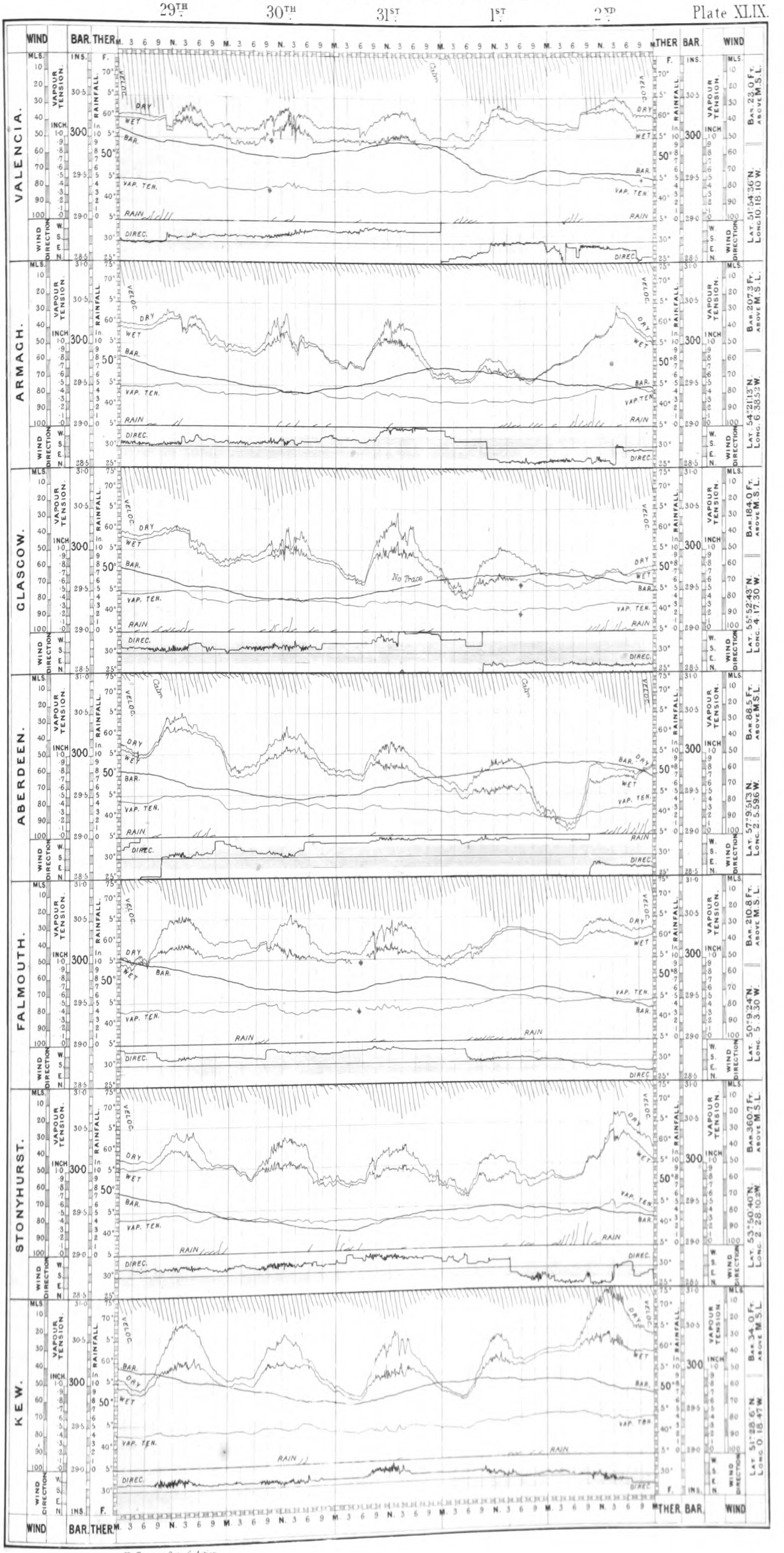



* No Trace or Out of Action.

# AUGUST & SEPTEMBER, 1872.

29TH 30TH 31ST 1ST 2ND

Plate XLIX.

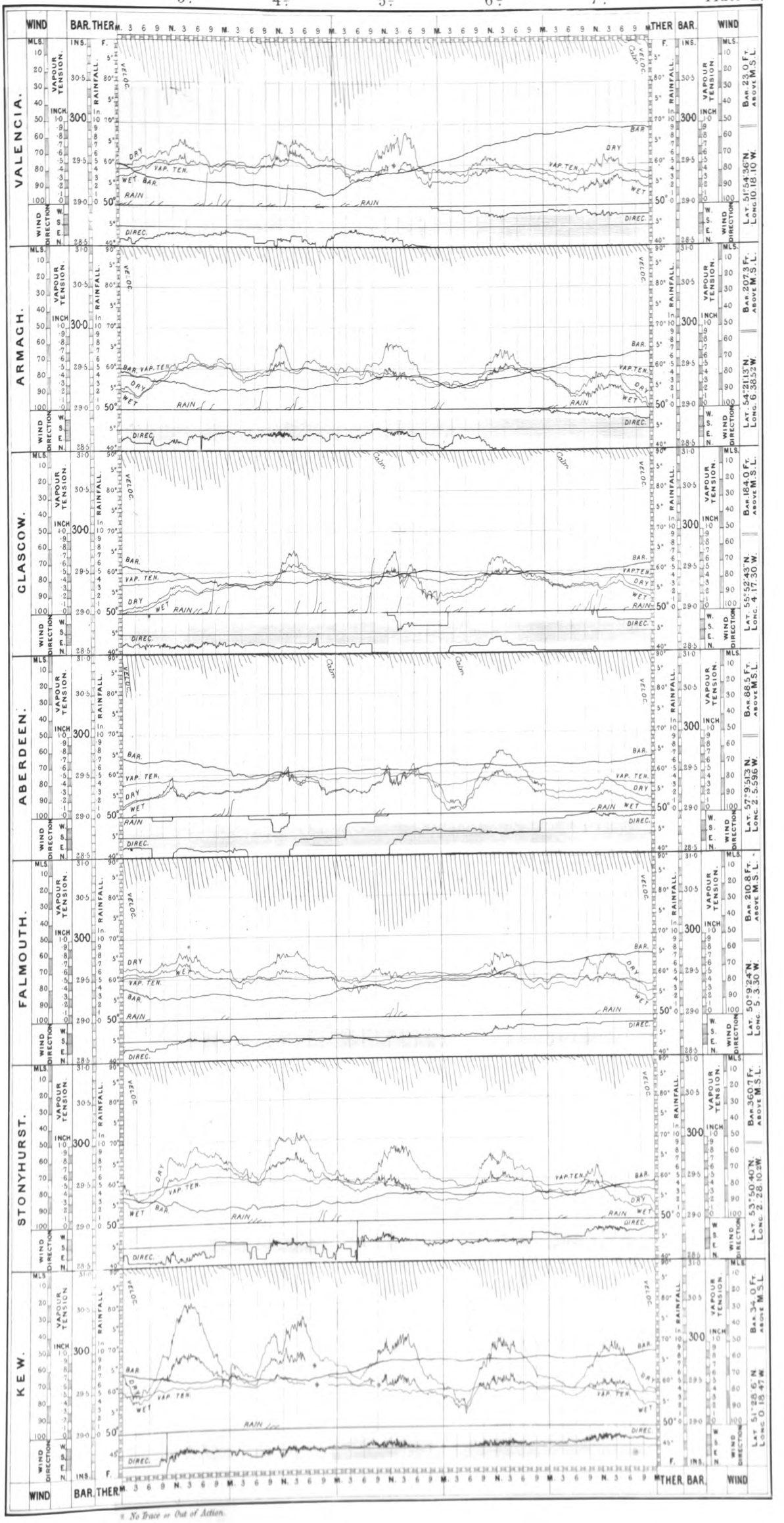



* No Trace or Out of Action.

# SEPTEMBER, — 1872.

Plate L.

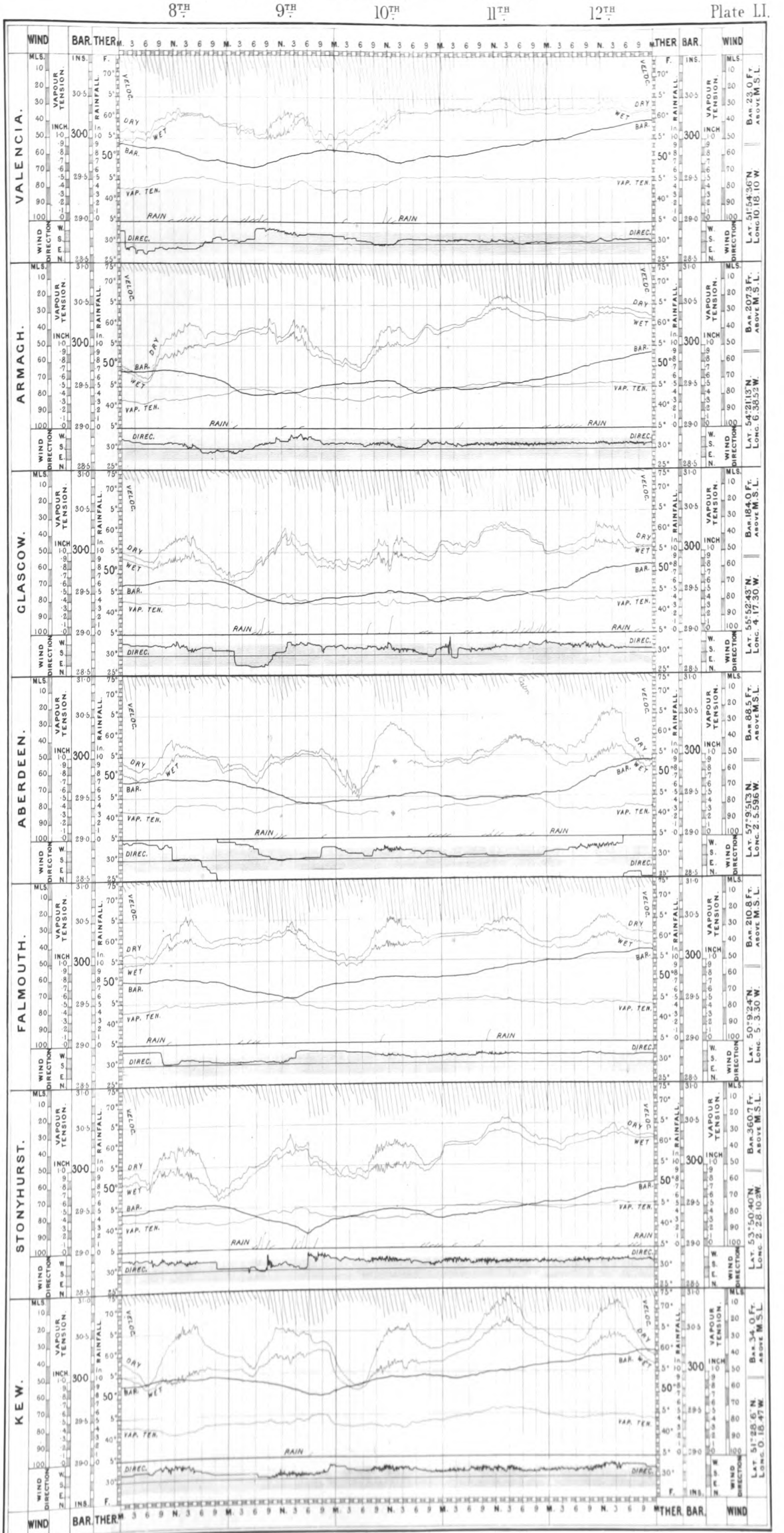
3RD 4TH 5TH 6TH 7TH




* No Trace or Out of Action.

# SEPTEMBER, — 1872.

8TH 9TH 10TH 11TH 12TH Plate LI.




* No Trace or Out of Action.

# SEPTEMBER, 1872

13TH 14TH 15TH 16TH 17TH

Plate I.II.

## VALENCIA.

Bar. 23.0 Ft. above M.S.L.
Lat. 51°54'36"N. Long. 10.18.10 W.

## ARMAGH.

Bar. 207.3 Ft. above M.S.L.
Lat. 54°21'13"N. Long. 6.38.53 W.

## GLASCOW.

Bar. 184.0 Ft. above M.S.L.
Lat. 55°52'43"N. Long. 4.17.30 W.

## ABERDEEN.

Bar. 88.5 Ft. above M.S.L.
Lat. 57°9.513 N. Long. 2.5.596 W.

## FALMOUTH.

Bar. 210.8 Ft. above M.S.L.
Lat. 50°9'24"N. Long. 5.3.30 W.

## STONYHURST.

Bar. 360.7 Ft. above M.S.L.
Lat. 53°50'40"N. Long. 2.28.10 W.

## KEW.

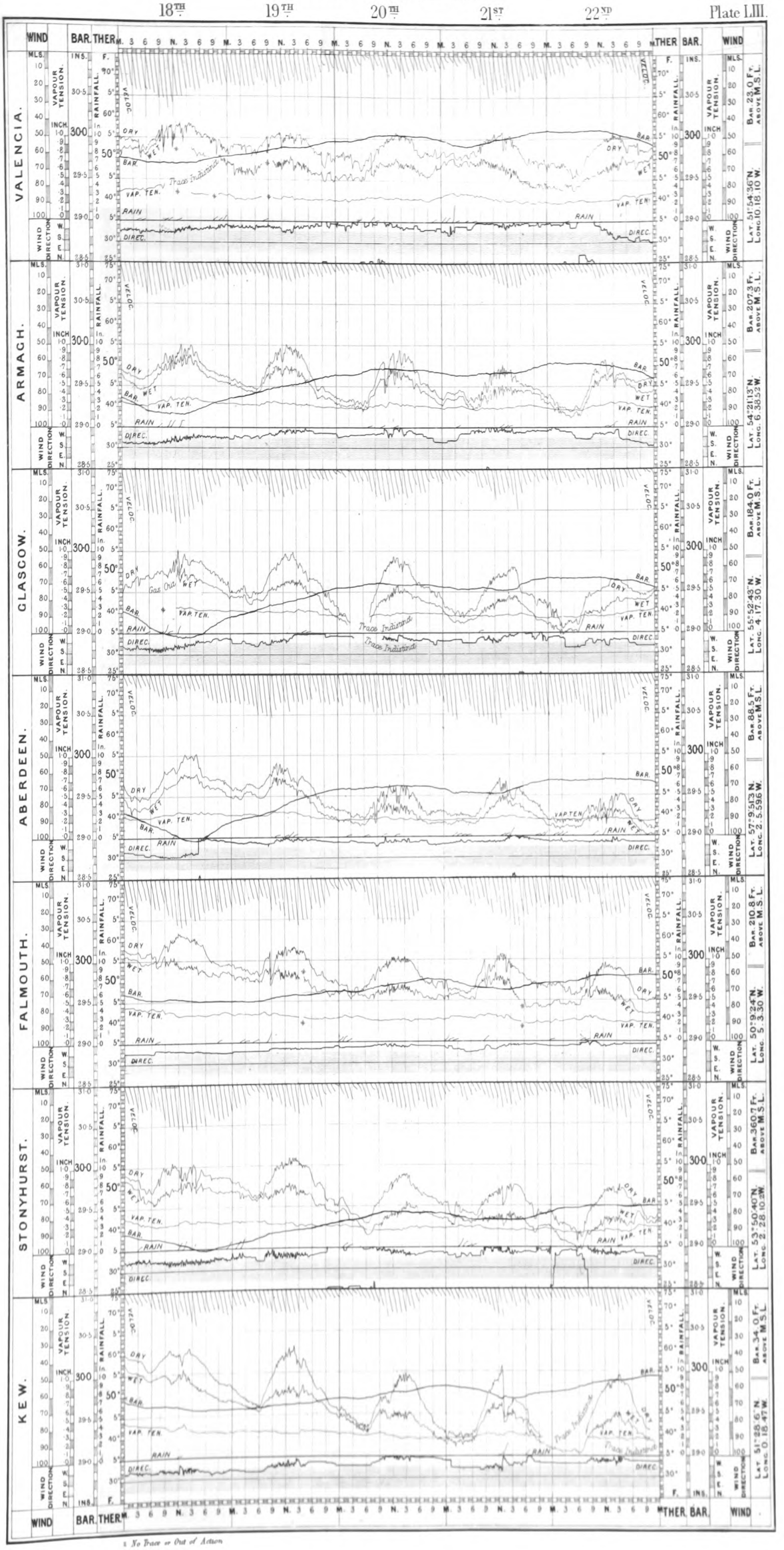
Bar. 34.0 Ft. above M.S.L.
Lat. 51°28.6"N. Long. 0.18.47 W.

1 No Trace or Out of Action

# SEPTEMBER, 1872.

18TH 19TH 20TH 21ST 22ND

Plate LIII.




1. No Trace or Out of Action

SEPTEMBER, — 1872.

Plate LIV.

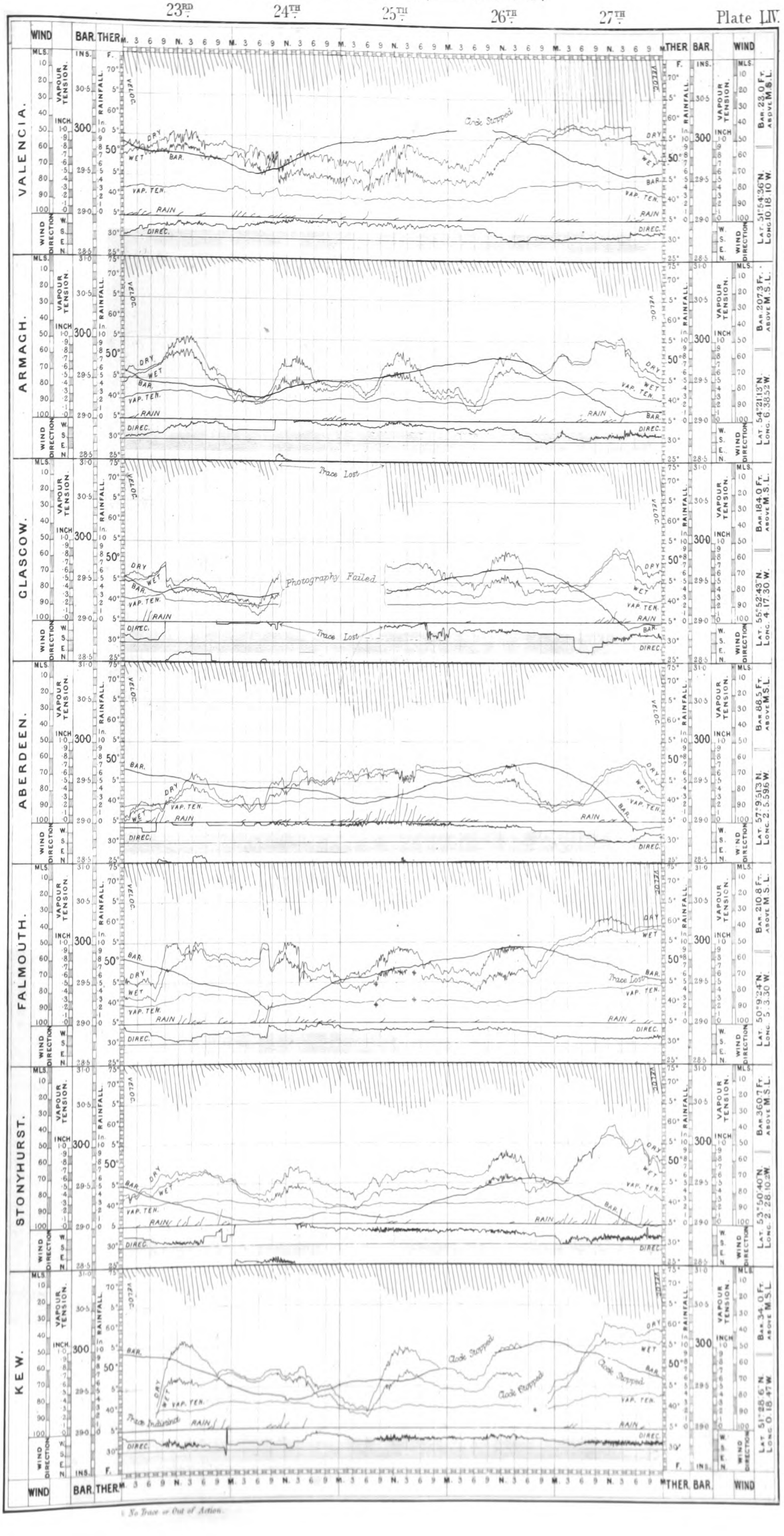
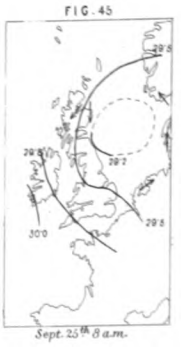
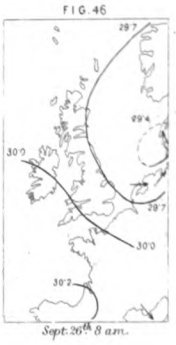



FIG. 45



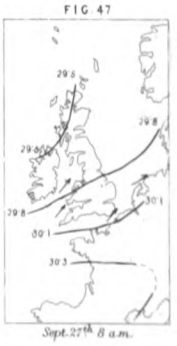
Sept. 25th 8 a.m.

FIG. 46



Sept. 26th 8 a.m.

FIG. 47



Sept. 27th 8 a.m.

FIG. 48

Sept. 27th 6 p.m.

No Trace or Out of Action.

# SEPTEMBER & OCTOBER, 1872.

28TH 29TH 30TH 1ST 2ND

Plate LV.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

## VALENCIA.

Lat. 51° 54' 36" N. Long. 10 18 10 W. Bar. 23.0 Ft. above M.S.L.

## ARMAGH.

Lat. 54° 21' 13" N. Long. 6 38 52 W. Bar. 207.3 Ft. above M.S.L.

## GLASCOW.

Lat. 55° 52' 43" N. Long. 4 17 30 W. Bar. 184.0 Ft. above M.S.L.

## ABERDEEN.

Lat. 57° 9' 51" N. Long. 2° 5.596 W. Bar. 88.5 Ft. above M.S.L.

## FALMOUTH.

Lat. 50° 9' 24" N. Long. 5 3 30 W. Bar. 210.8 Ft. above M.S.L.

## STONYHURST.

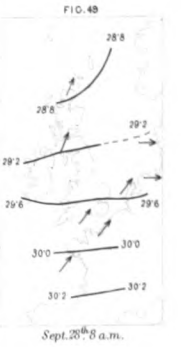
Lat. 53° 50' 40" N. Long. 2 28 10 W. Bar. 360.7 Ft. above M.S.L.

## KEW.

Lat. 51° 28' 6" N. Long. 0 18 47 W. Bar. 34.0 Ft. above M.S.L.

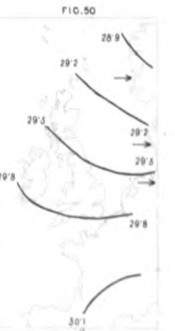
WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

FIG. 48



Sept. 29th 8 a.m.

FIG. 50



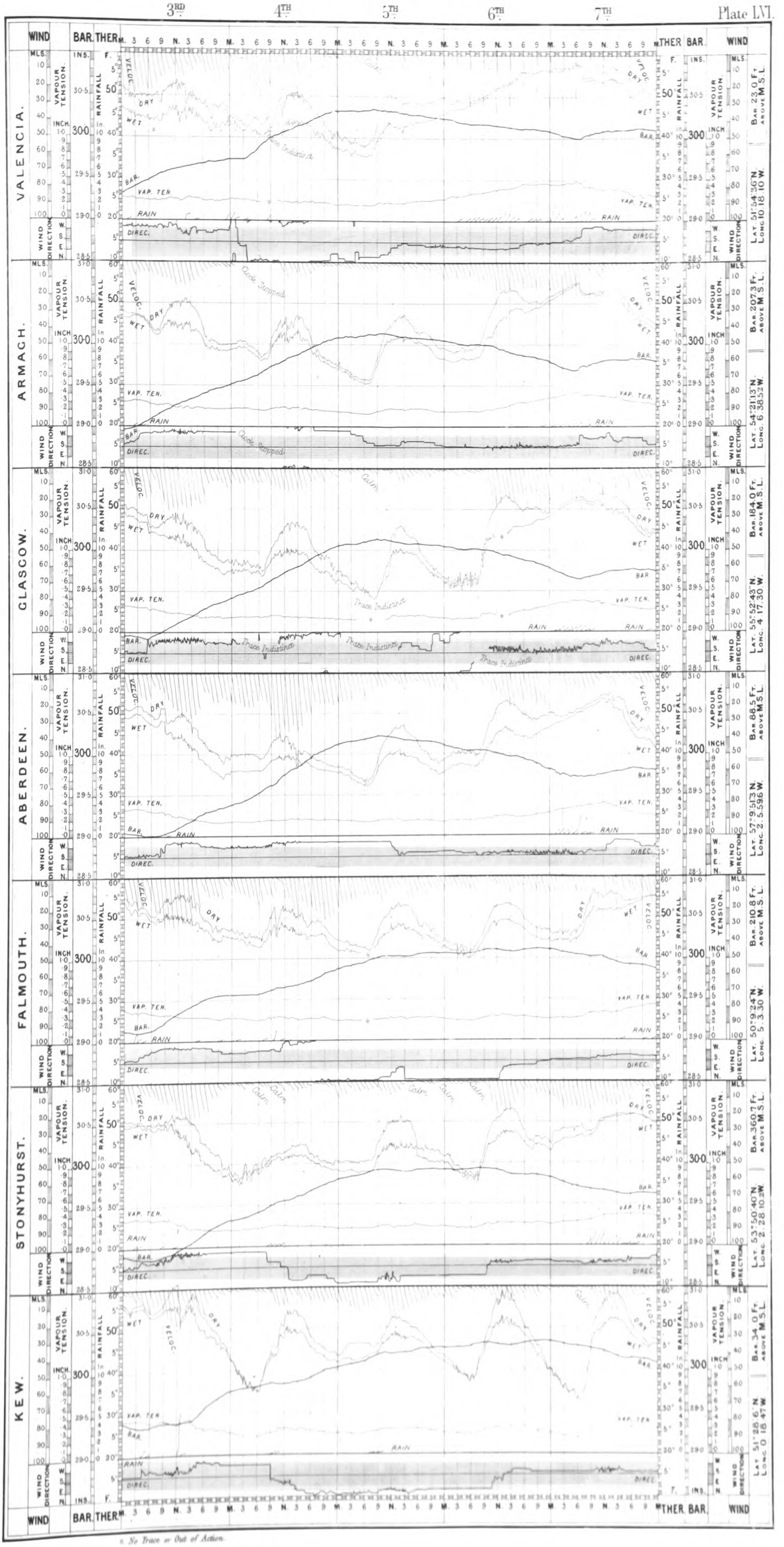
Sept. 29th 8 a.m.

* No Trace or Out of Action.

# OCTOBER. 1872.

Plate LVI.

3RD 4TH 5TH 6TH 7TH




* No Trace or Out of Action.

OCTOBER, 1872.

Plate LVII.

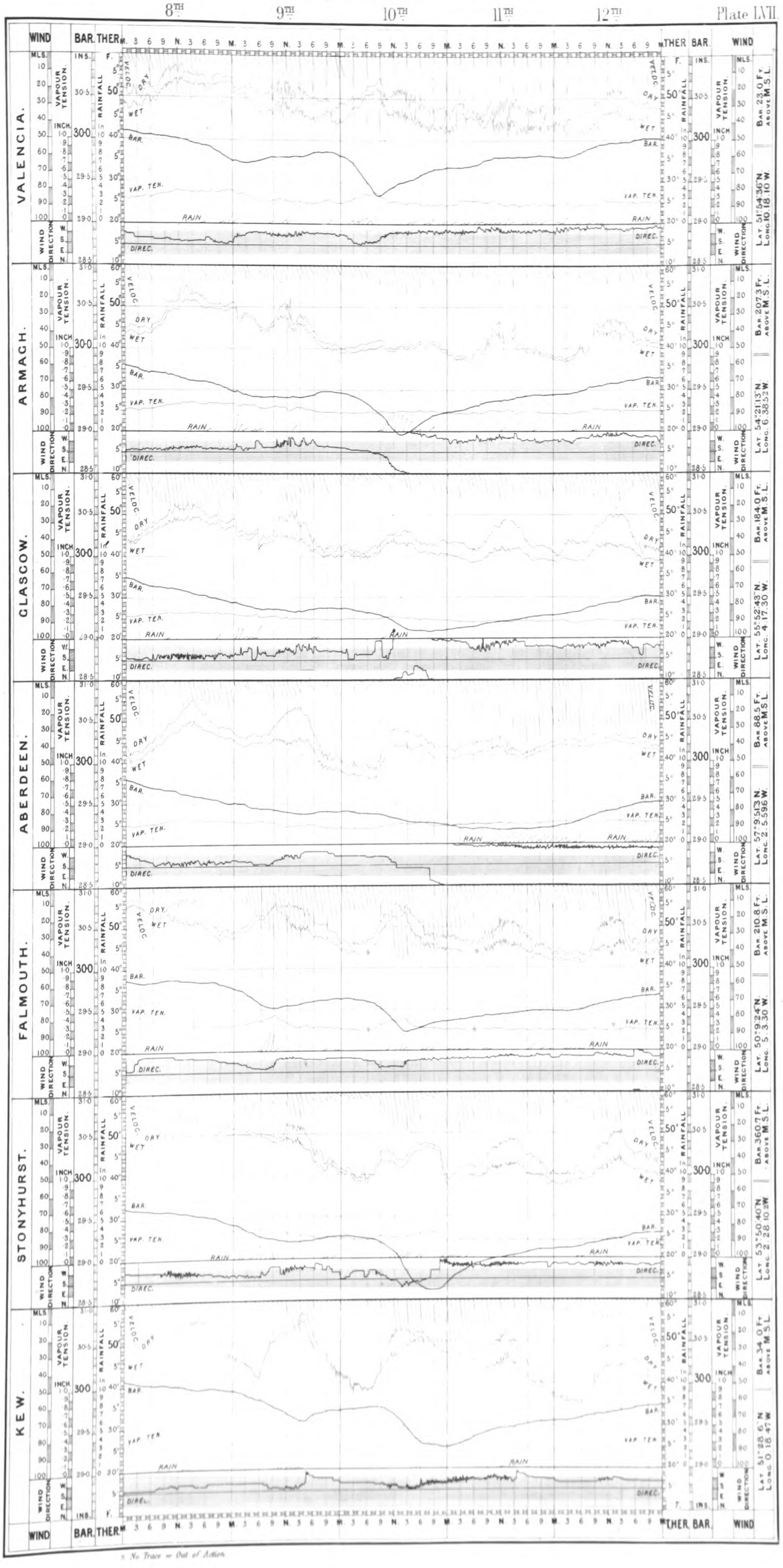
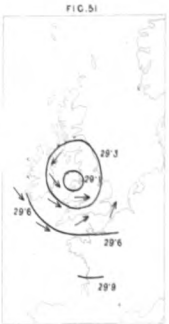
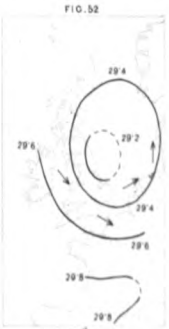



FIG. 51




Oct. 10th 6 p.m.

FIG. 52




Oct. 11th 8 a.m.

* No Trace = Out of Action

# OCTOBER.—1872.

13TH 14TH 15TH 16TH 17TH

Plate LVIII.

VALENCIA. Bar 23.0 Ft. above M.S.L. Lat. 51°54'36"N. Long. 10.18.10 W.

ARMAGH. Bar 207.3 Ft. above M.S.L. Lat. 54°21'13"N. Long. 6.38.52 W.

GLASCOW. Bar 184.0 Ft. above M.S.L. Lat. 55°52'48"N. Long. 4.17.30 W.

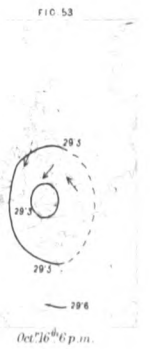
ABERDEEN. Bar 88.5 Ft. above M.S.L. Lat. 57°9'51"N. Long. 2.5.56 W.

FALMOUTH. Bar 210.8 Ft. above M.S.L. Lat. 50°9'24"N. Long. 5.30 W.

STONYHURST. Bar 360.7 Ft. above M.S.L. Lat. 53°50'40"N. Long. 2.28.10 W.

KEW. Bar 34.0 Ft. above M.S.L. Lat. 51°28'6"N. Long. 0.18.47 W.

FIG. 53



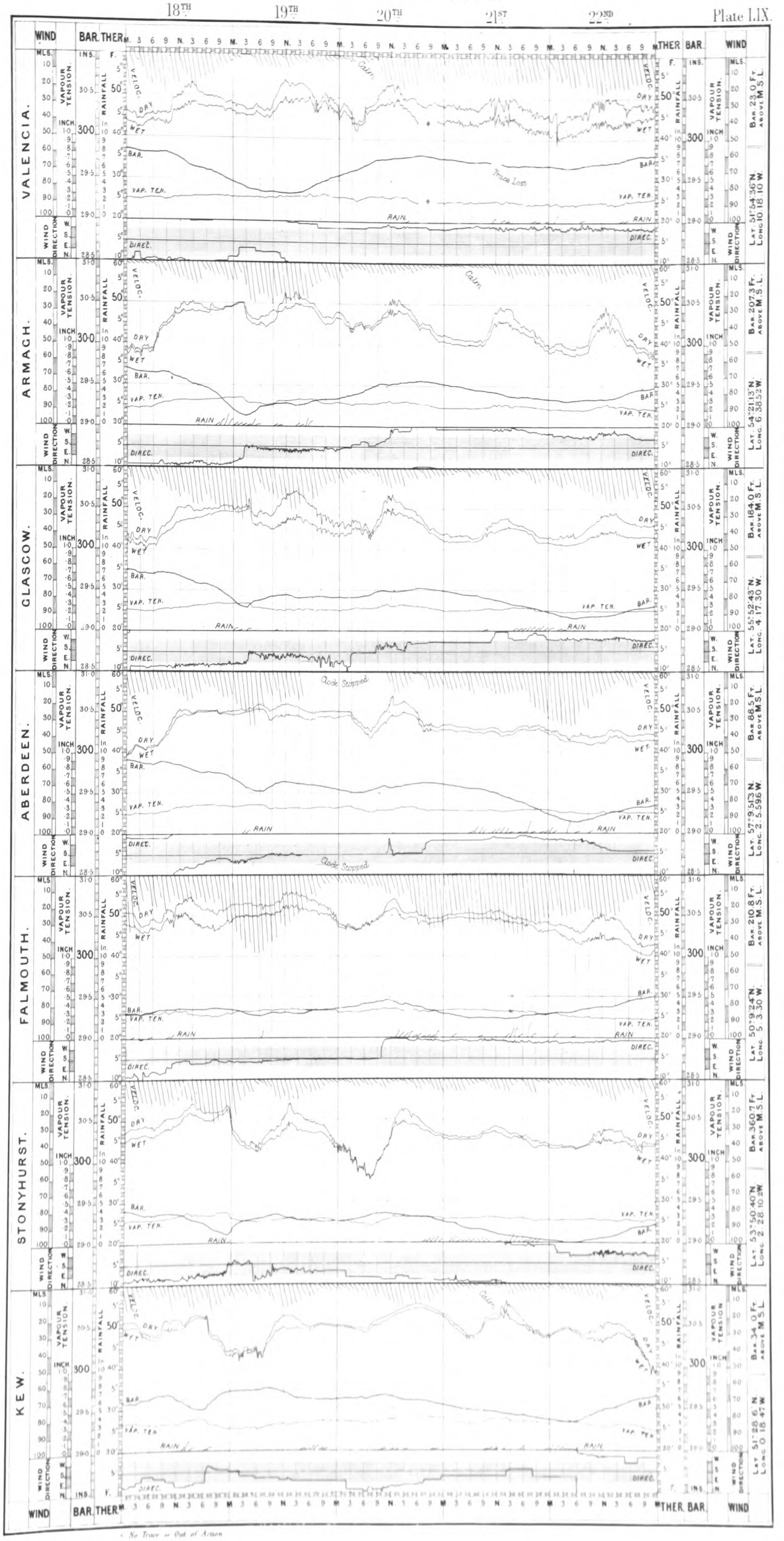

Oct.16th 6 p.m.

* No Trace or Out of Action.

# OCTOBER. 1872.

Plate LIX.

18TH 19TH 20TH 21ST 22ND

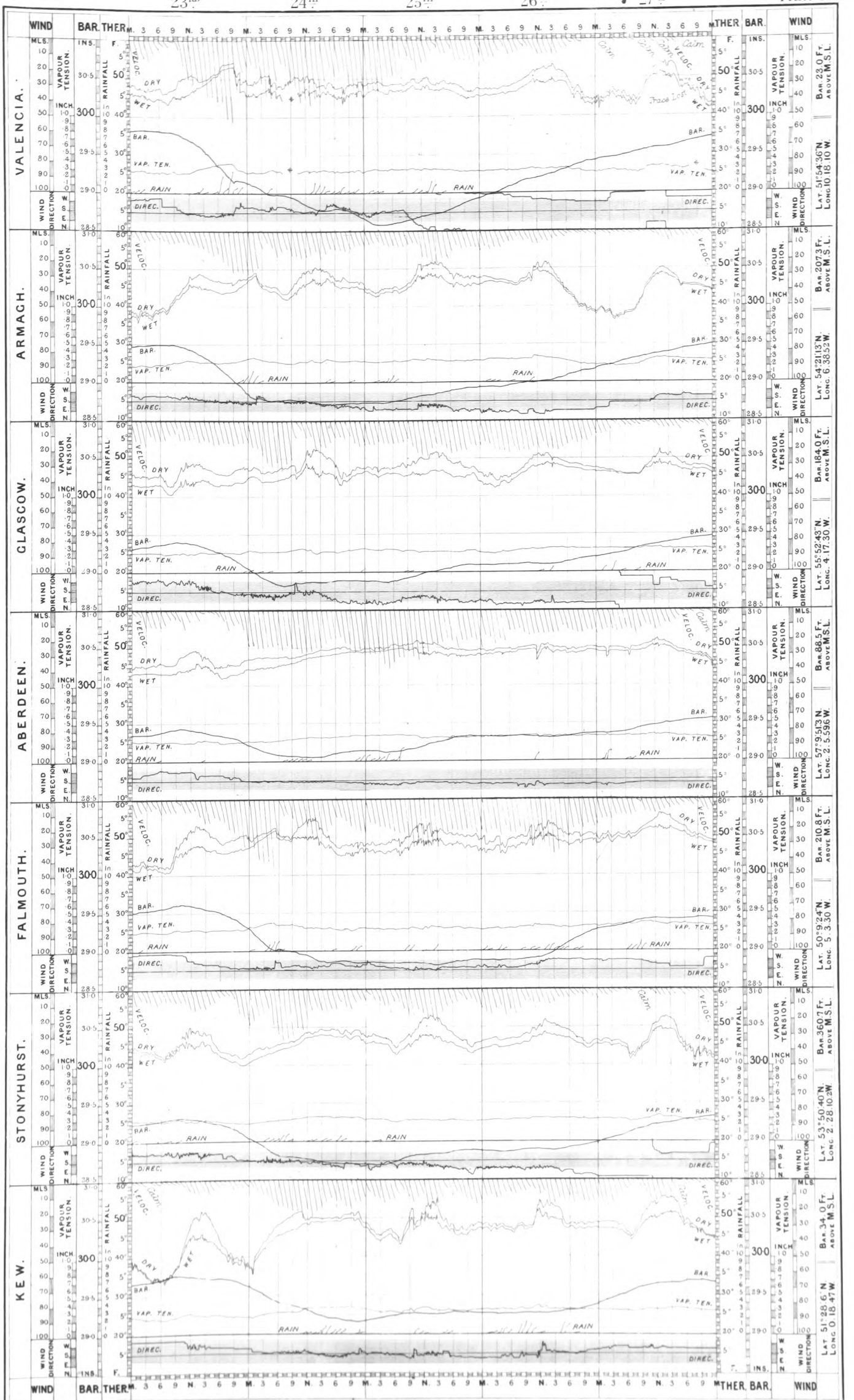



* No Trace or Out of Action

# OCTOBER, 1872.

23RD 24TH 25TH 26TH 27TH

Plate IX.




* No Trace or Out of Action

# OCTOBER & NOVEMBER, 1872.

Plate LXI.

28TH | 29TH | 30TH | 31ST | 1ST

VALENCIA. Bar. 23.0 Ft. above M.S.L. Lat. 51°54'36" N. Long. 10.18.10 W.

ARMAGH. Bar. 207.3 Ft. above M.S.L. Lat. 54°21'13" N. Long. 6.38.52 W.

GLASCOW. Bar. 184.0 Ft. above M.S.L. Lat. 55°52'43" N. Long. 4.17.30 W.

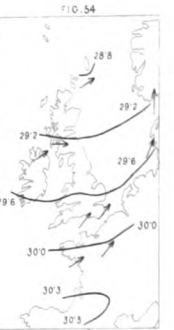
ABERDEEN. Bar. 88.5 Ft. above M.S.L. Lat. 57°9'51"3 N. Long. 2.5.596 W.

FALMOUTH. Bar. 210.8 Ft. above M.S.L. Lat. 50°9'24" N. Long. 5.3.30 W.

STONYHURST. Bar. 360.7 Ft. above M.S.L. Lat. 53°50'40" N. Long. 2.28.10 W.

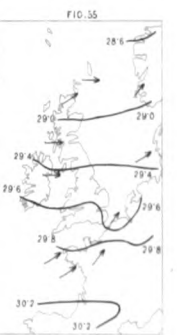
KEW. Bar. 34.0 Ft. above M.S.L. Lat. 51°28'6" N. Long. 0.18.47 W.

FIG. 54



October 30th 8 a.m.

FIG. 55



October 31st 8 a.m.

× No Trace or Out of Action

# NOVEMBER, 1872.

Plate LXII.

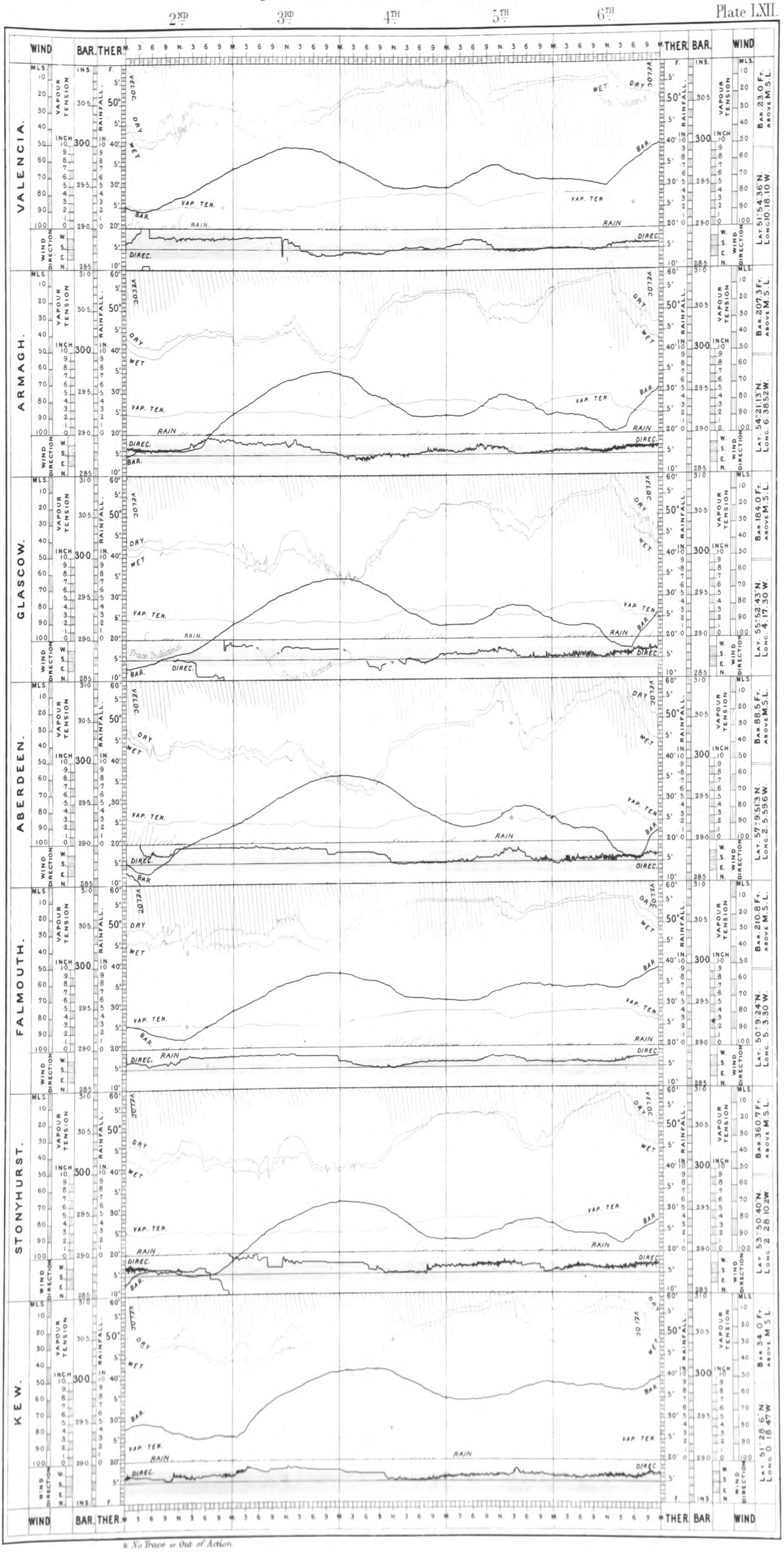
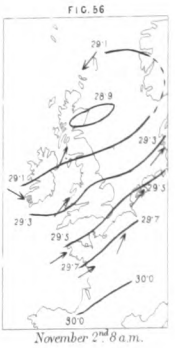
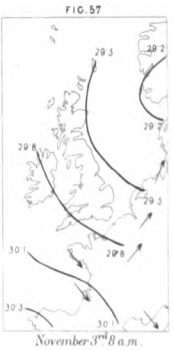



FIG. 56



November 2nd 8 a.m.

FIG. 57



November 3rd 8 a.m.

* No Trace or Out of Action.

NOVEMBER. — 1872

Plate LXIII.

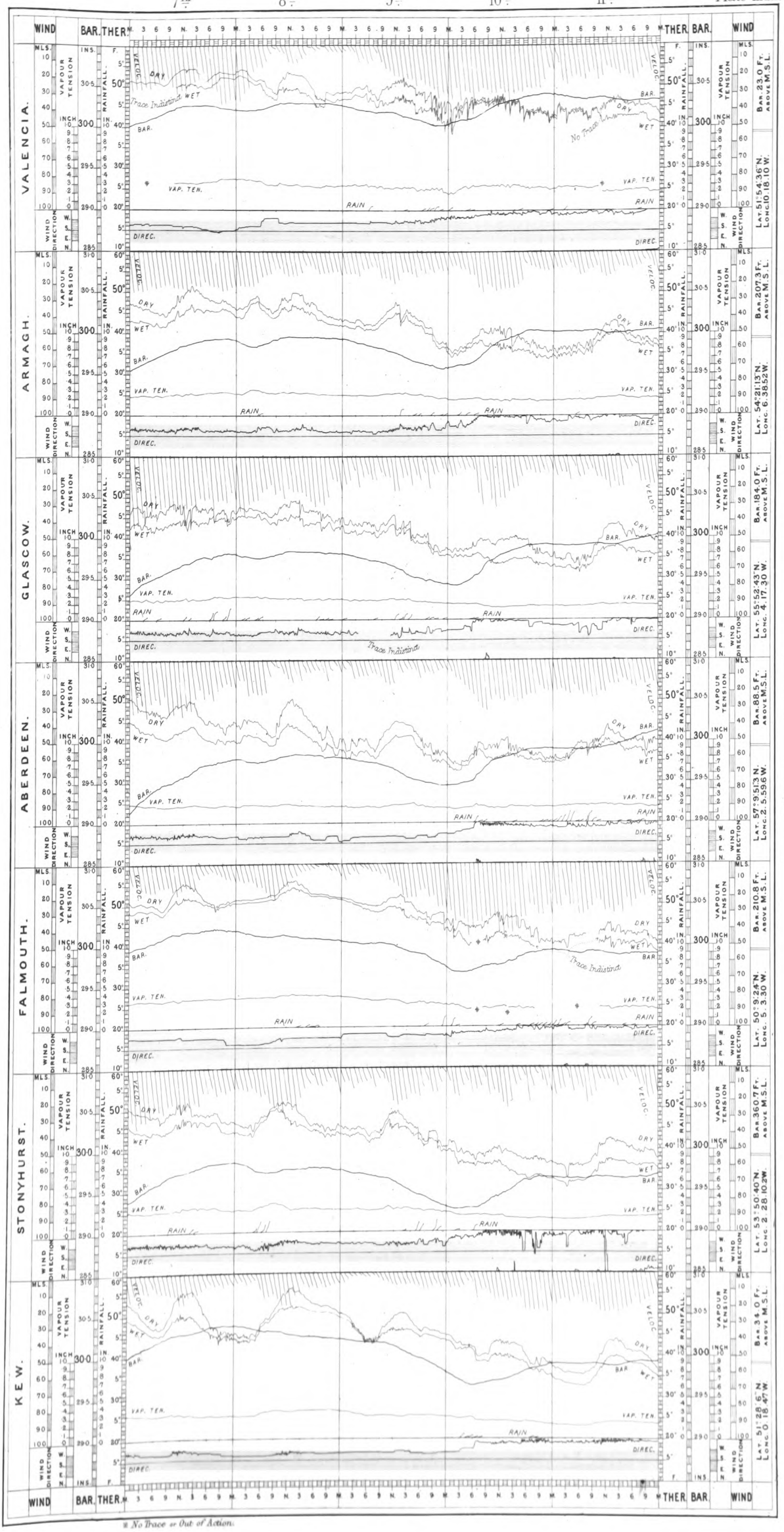
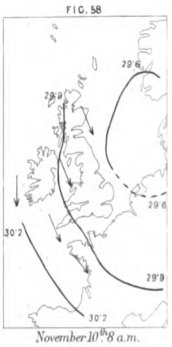



FIG. 58




November 10th 8 a.m.

* No Trace or Out of Action.

NOVEMBER, 1872.

Plate LXIV.

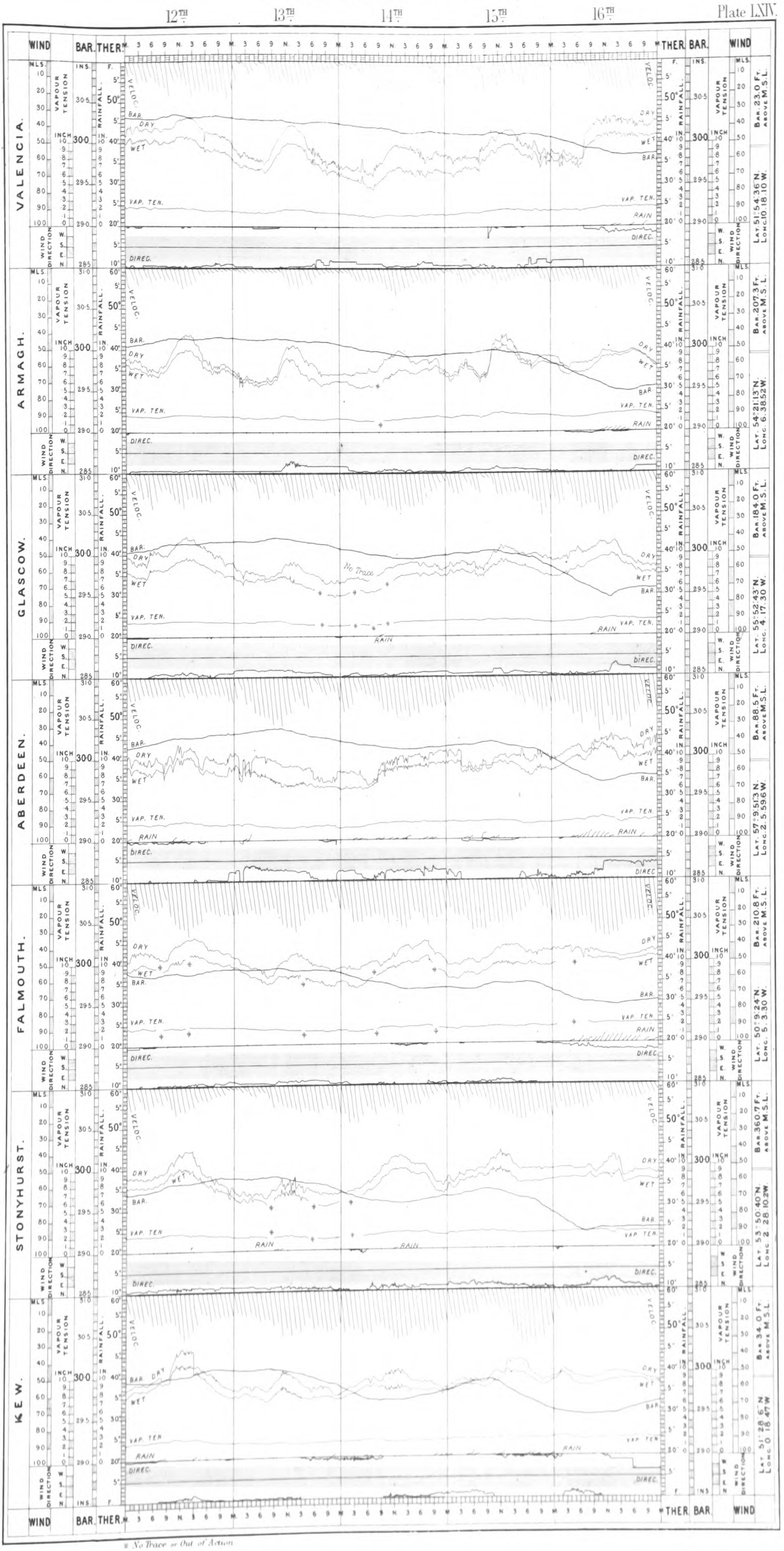
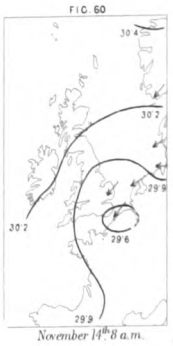



FIG. 59

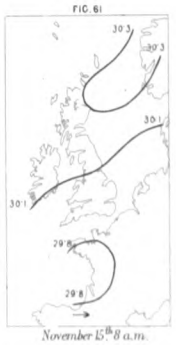
November 13th 8 a.m.

FIG. 60



November 14th 8 a.m.

FIG. 61



November 15th 8 a.m.

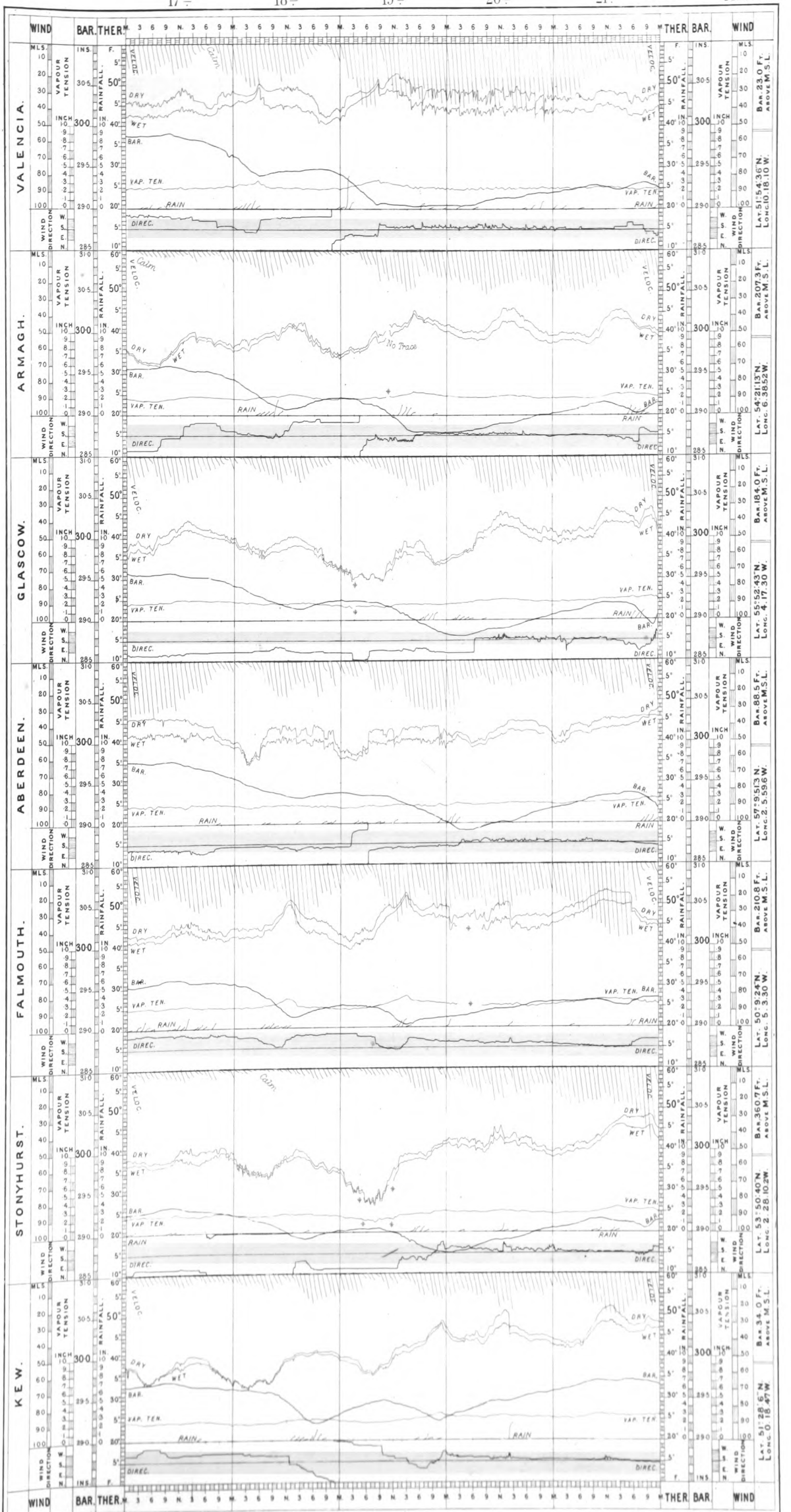
FIG. 62

November 16th 8 a.m.

* No Trace or Out of Action

# NOVEMBER, 1872

17TH 18TH 19TH 20TH 21ST




* No Trace or Out of Action.

# NOVEMBER, — 1872.

22ND 23RD 24TH 25TH 26TH

Plate LXVI.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

## VALENCIA.

MLS. VAPOUR TENSION INCH INS. RAINFALL IN. F. VELOC. DRY WET VAP. TEN. BAR. RAIN DIREC. WIND DIRECTION W. S. E. N.

Bar. 23.0 Ft. Above M.S.L.

Lat. 51° 54' 36" N. Long. 10° 18' 10" W.

## ARMAGH.

28'30

Bar. 207.3 Ft. Above M.S.L.

Lat. 54° 21' 13" N. Long. 6° 38' 52" W.

## GLASCOW.

28'22

Bar. 184.0 Ft. Above M.S.L.

Lat. 55° 52' 43" N. Long. 4° 17' 30" W.

## ABERDEEN.

28'25

Bar. 88.5 Ft. Above M.S.L.

Lat. 57° 9' 51" N. Long. 2° 5' 59" W.

## FALMOUTH.

28'415

Bar. 210.8 Ft. Above M.S.L.

Lat. 50° 9' 24" N. Long. 5° 3' 30" W.

## STONYHURST.

Bar. 360.7 Ft. Above M.S.L.

Lat. 53° 50' 40" N. Long. 2° 28' 10" W.

## KEW.

28'40

Bar. 34.0 Ft. Above M.S.L.

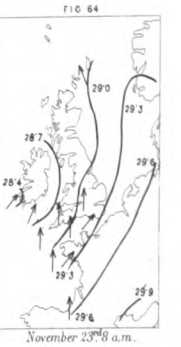
Lat. 51° 28' 6" N. Long. 0° 18' 4" W.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

FIG. 63

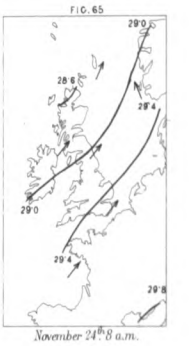
November 22nd 6 p.m.

FIG. 64



November 23rd 8 a.m.

FIG. 65

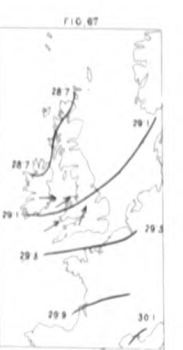


November 24th 8 a.m.

FIG. 66

November 25th 8 a.m.

FIG. 67



November 26th 8 a.m.

* No Trace or Out of Action.

NOVEMBER & DECEMBER, 1872.

Plate LXVII.

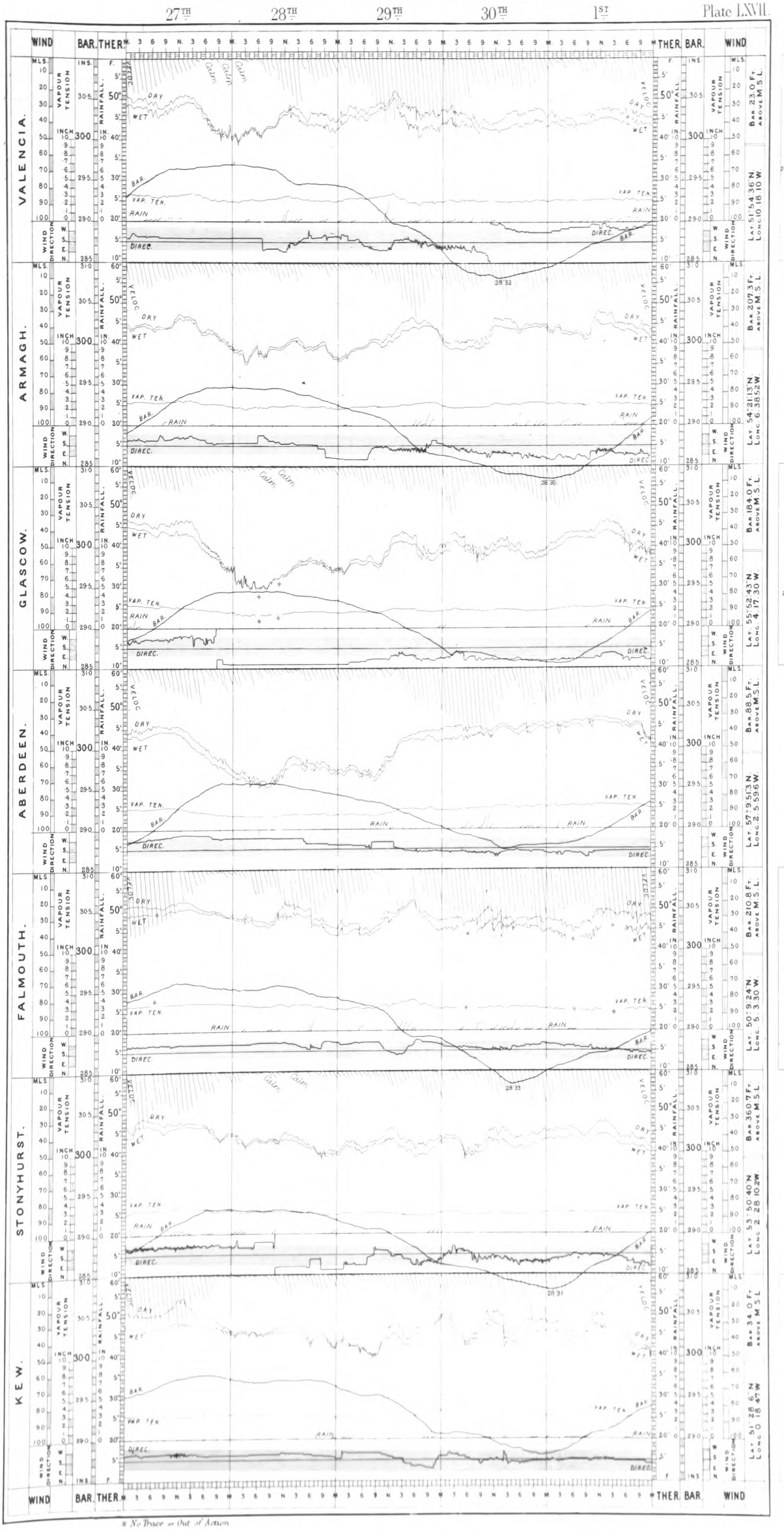
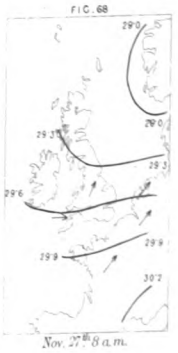
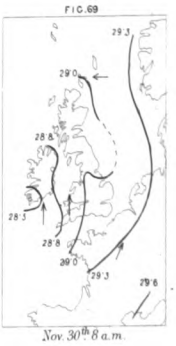



FIG. 68



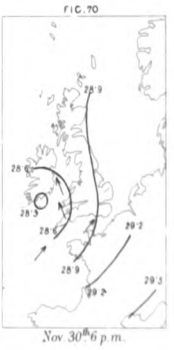
Nov. 27th 8 a.m.

FIG. 69



Nov. 30th 8 a.m.

FIG. 70



Nov. 30th 6 p.m.

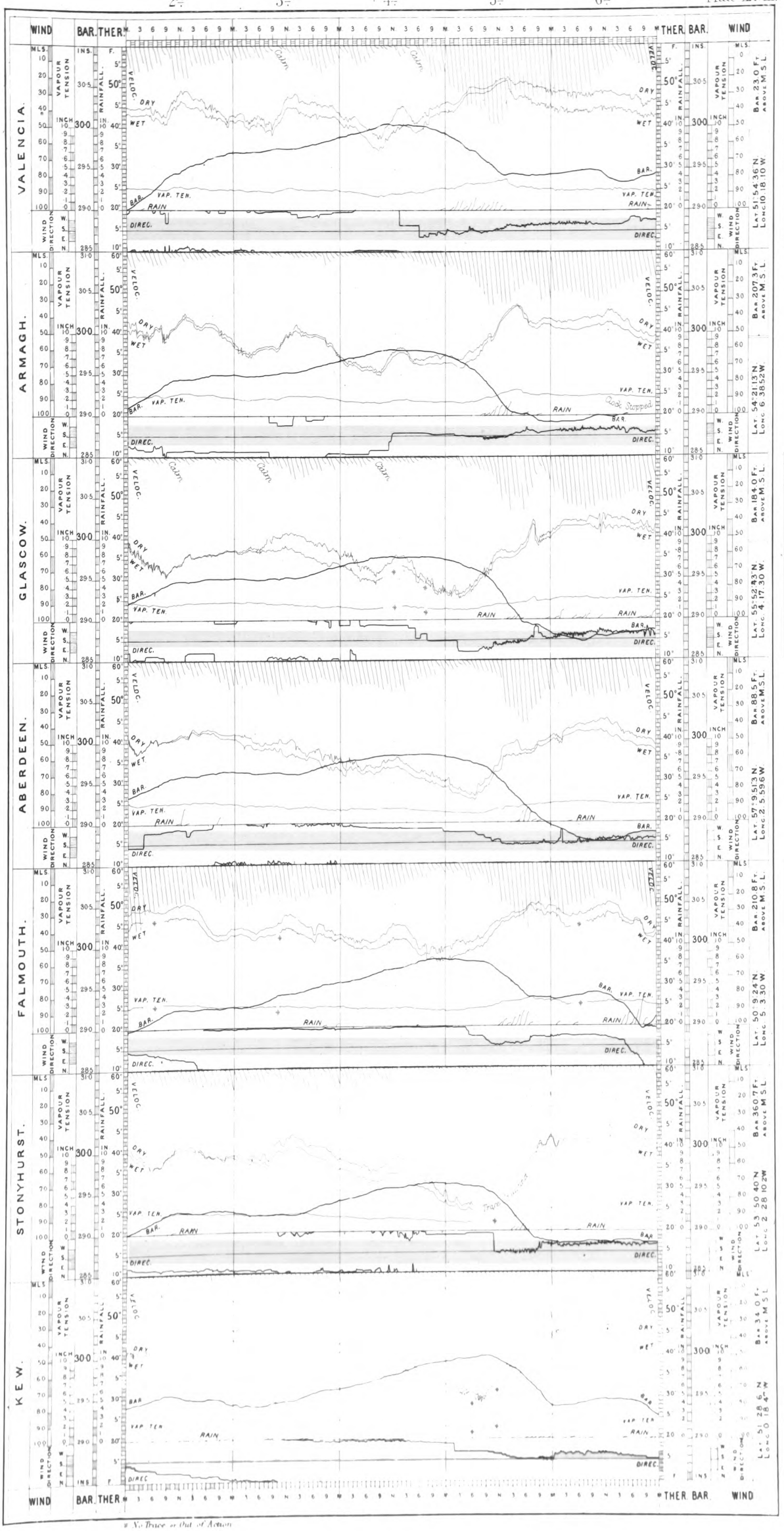
FIG. 71

Dec. 1st 8 a.m.

* No Trace or Out of Action

DECEMBER, 1872.

Plate LXVIII.

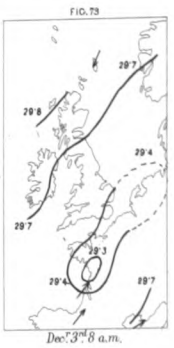



* No Trace or Out of Action

FIG. 72

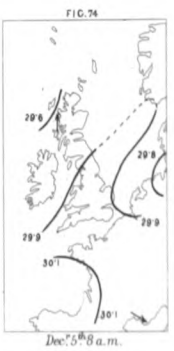
Decr. 2nd 8 a.m.

FIG. 73



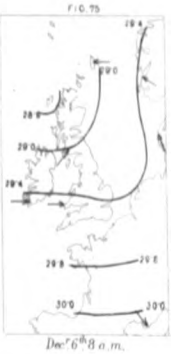
Decr. 3rd 8 a.m.

FIG. 74



Decr. 5th 8 a.m.

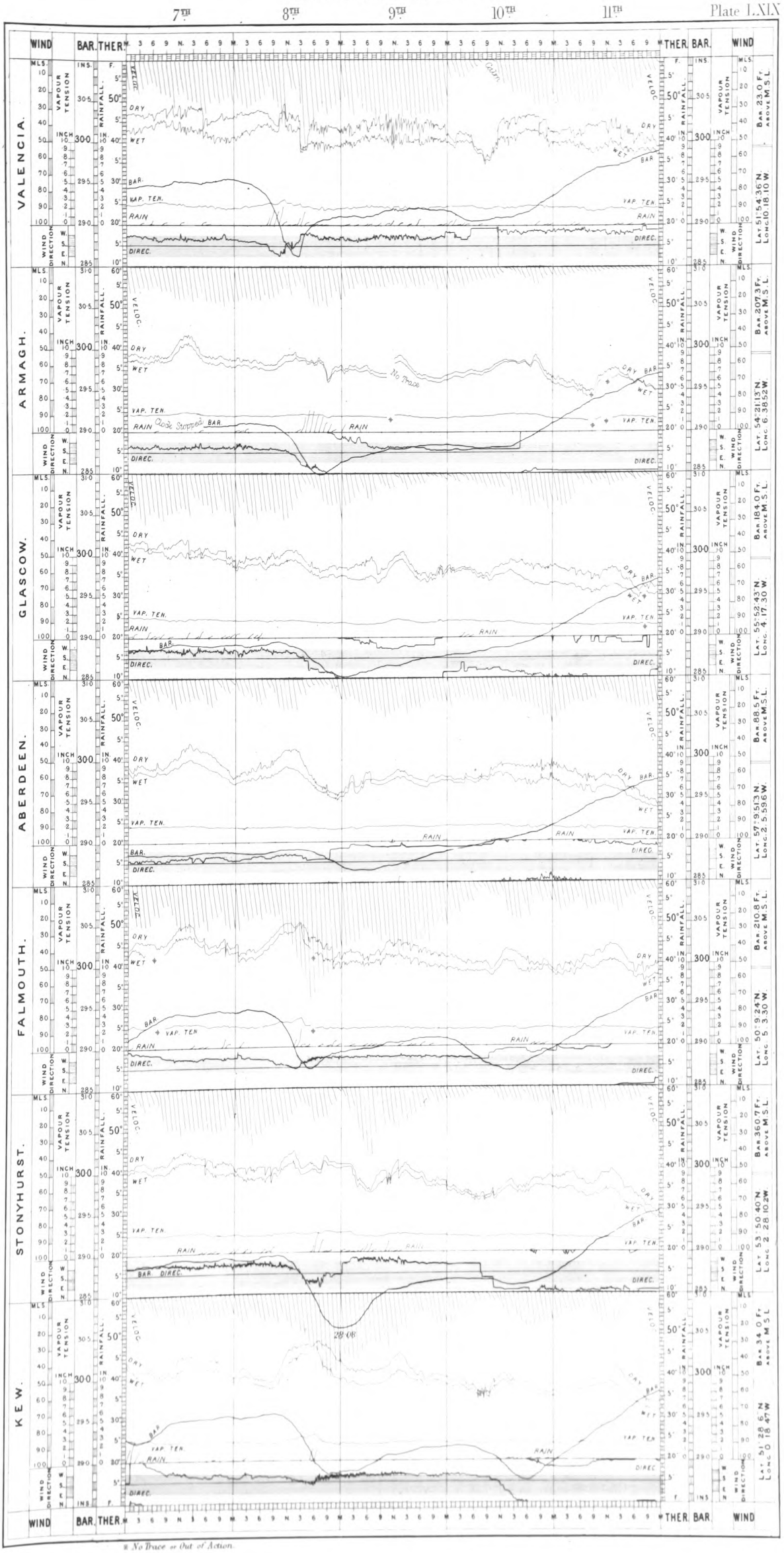
FIG. 75



Decr. 6th 8 a.m.

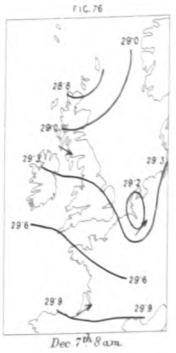
DECEMBER, — 1872.

Plate LXIX



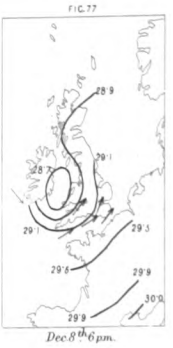

* No Trace or Out of Action.

FIG. 76



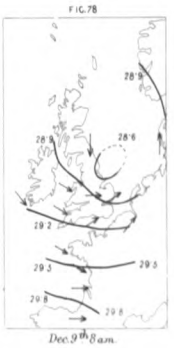
Dec. 7th 8 a.m.

FIG. 77



Dec. 8th 6 p.m.

FIG. 78



Dec. 9th 8 a.m.

FIG. 79

Dec. 11th 8 a.m.

# DECEMBER, 1872.

Plate LXX.

12TH 13TH 14TH 15TH 16TH

## VALENCIA.

Lat. 51° 54' 36" N. Long. 10° 18' 10" W. Bar. 23.0 Ft. above M.S.L.

## ARMAGH.

Lat. 54° 21' 13" N. Long. 6° 38' 52" W. Bar. 207.3 Ft. above M.S.L.

## GLASCOW.

Lat. 55° 52' 43" N. Long. 4° 17' 30" W. Bar. 184.0 Ft. above M.S.L.

## ABERDEEN.

Lat. 57° 9' 51" N. Long. 2° 5' 9" W. Bar. 88.5 Ft. above M.S.L.

## FALMOUTH.

Lat. 50° 9' 24" N. Long. 5° 3' 30" W. Bar. 210.8 Ft. above M.S.L.

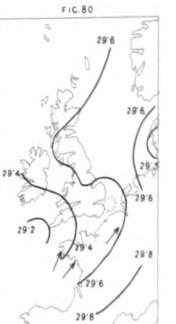
## STONYHURST.

Lat. 53° 50' 40" N. Long. 2° 28' 10" W. Bar. 360.7 Ft. above M.S.L.

## KEW.

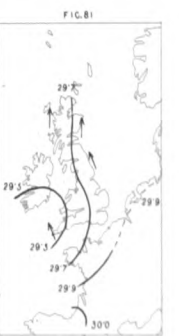
Lat. 51° 28' 6" N. Long. 0° 18' 47" W. Bar. 34.0 Ft. above M.S.L.

FIG. 80



Dec^r 14th 8 a.m.

FIG. 81



Dec^r 16th 6 p.m.

* No Trace or Out of Action.

# DECEMBER, — 1872.

17TH 18TH 19TH 20TH 21ST Plate LXXI.

VALENCIA.

ARMAGH.

GLASCOW.

ABERDEEN.

FALMOUTH.

STONYHURST.

KEW.

Bar. 23.0 Ft. Above M.S.L. Lat. 51°54'36"N. Long. 10.18.10 W.

Bar. 207.3 Ft. Above M.S.L. Lat. 54°21.13"N. Long. 6.38.52 W.

Bar. 184.0 Ft. Above M.S.L. Lat. 55°52.43"N. Long. 4.17.30 W.

Bar. 88.5 Ft. Above M.S.L. Lat. 57°9.51.3"N. Long. 2.5.59 W.

Bar. 210.8 Ft. Above M.S.L. Lat. 50°9.24"N. Long. 5.3.30 W.

Bar. 360.7 Ft. Above M.S.L. Lat. 53°50.40"N. Long. 2.28.10 W.

Bar. 34.0 Ft. Above M.S.L. Lat. 51°28.6"N. Long. 0.18.47 W.

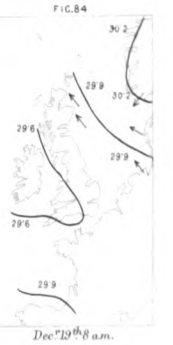
FIG. 82

Dec.r 17th 8 a.m.

FIG. 83

Dec.r 18th 8 a.m.

FIG. 84

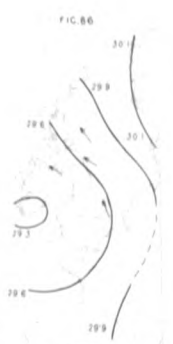


Dec.r 19th 8 a.m.

FIG. 85

Dec.r 20th 8 a.m.

FIG. 86



Dec.r 21st 8 a.m.

* No Trace or Out of Action

# DECEMBER, 1872.

22ND 23RD 24TH 25TH 26TH

Plate LXXII.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

## VALENCIA.

MLS. VAPOUR TENSION INCH INS. RAINFALL IN. F. WIND DIRECTION W. S. E. N.

DRY WET VELOC. BAR. VAP. TE. RAIN DIREC.

28·47

VAP. TEN. BAR. RAIN DIREC.

Bar. 23.0 Fr. above M.S.L.

Lat. 51° 54′ 36″ N. Long. 10. 18. 10 W.

## ARMAGH.

DRY WET VELOC. BAR. VAP. TEN. RAIN DIREC.

Trace Lost

28·405

Bar. 207.3 Fr. above M.S.L.

Lat. 54° 21′ 13″ N. Long. 6. 38. 52 W.

## GLASCOW.

DRY WET VELOC. BAR. VAP. TEN. RAIN DIREC.

28·465

Bar. 184.0 Fr. above M.S.L.

Lat. 55° 52′ 43″ N. Long. 4. 17. 30 W.

## ABERDEEN.

DRY WET VELOC. BAR. VAP. TEN. RAIN DIREC.

Bar. 88.5 Fr. above M.S.L.

Lat. 57° 9′ 51″ N. Long. 2. 5. 59 W.

## FALMOUTH.

DRY WET VELOC. BAR. VAP. TEN. RAIN DIREC.

Bar. 210.8 Fr. above M.S.L.

Lat. 50° 9′ 24″ N. Long. 5. 3. 30 W.

## STONYHURST.

DRY WET VELOC. BAR. VAP. TEN. RAIN DIREC.

Bar. 360.7 Fr. above M.S.L.

Lat. 53° 50′ 40″ N. Long. 2. 28. 10 W.

## KEW.

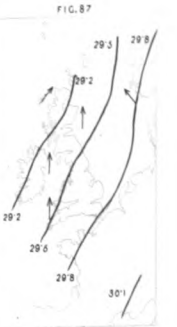
DRY WET VELOC. BAR. VAP. TEN. RAIN DIREC.

Bar. 34. 0 Fr. above M.S.L.

Lat. 51° 28′ 6″ N. Long. 0. 18. 47 W.

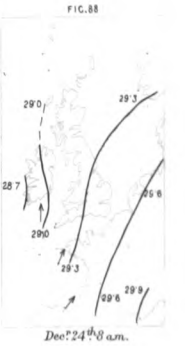
WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

FIG. 87




Dec.r 23rd 8 a.m.

FIG. 88




Dec.r 24th 8 a.m.

FIG. 89

Dec.r 25th 8 a.m.

* No Trace or Out of Action.

# DECEMBER, 1872.

27TH 28TH 29TH 30TH 31ST

Plate LXXIII.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

## VALENCIA.

MLS. VAPOUR TENSION INCH INS. RAINFALL IN F. VELOC. DRY WET VAP. TEN. BAR. RAIN DIREC. WIND DIRECTION W. S. E. N.

Calm. Calm. Calm. Clock Stopped

Bar. 23.0 Fr. above M.S.L.

Lat. 51° 54' 36" N. Long. 10. 18. 10 W.

## ARMAGH.

Bar. 207.3 Fr. above M.S.L.

Lat. 54° 21' 13" N. Long. 6. 38. 52 W.

## GLASCOW.

Bar. 184.0 Fr. above M.S.L.

Lat. 55° 52' 43" N. Long. 4. 17. 30 W.

## ABERDEEN.

Bar. 88.5 Fr. above M.S.L.

Lat. 57° 9' 51" N. Long. 2. 5. 59 W.

No Trace

## FALMOUTH.

Bar. 210.8 Fr. above M.S.L.

Lat. 50° 9' 24" N. Long. 5. 3. 30 W.

## STONYHURST.

Bar. 360.7 Fr. above M.S.L.

Lat. 53° 50' 40" N. Long. 2. 28. 10 W.

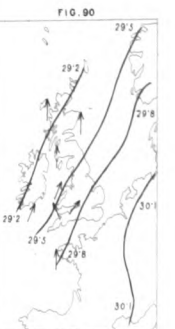
## KEW.

Bar. 34.0 Fr. above M.S.L.

Lat. 51° 28' 6" N. Long. 0. 18. 47 W.

WIND BAR. THER. M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. 3 6 9 N. 3 6 9 M. THER. BAR. WIND

FIG. 90




Dec.r 27th 8 a.m.

FIG. 91

Dec.r 31st 8 a.m.

* No Trace or Out of Action.